

APRIL 19, 1954

# STEEL

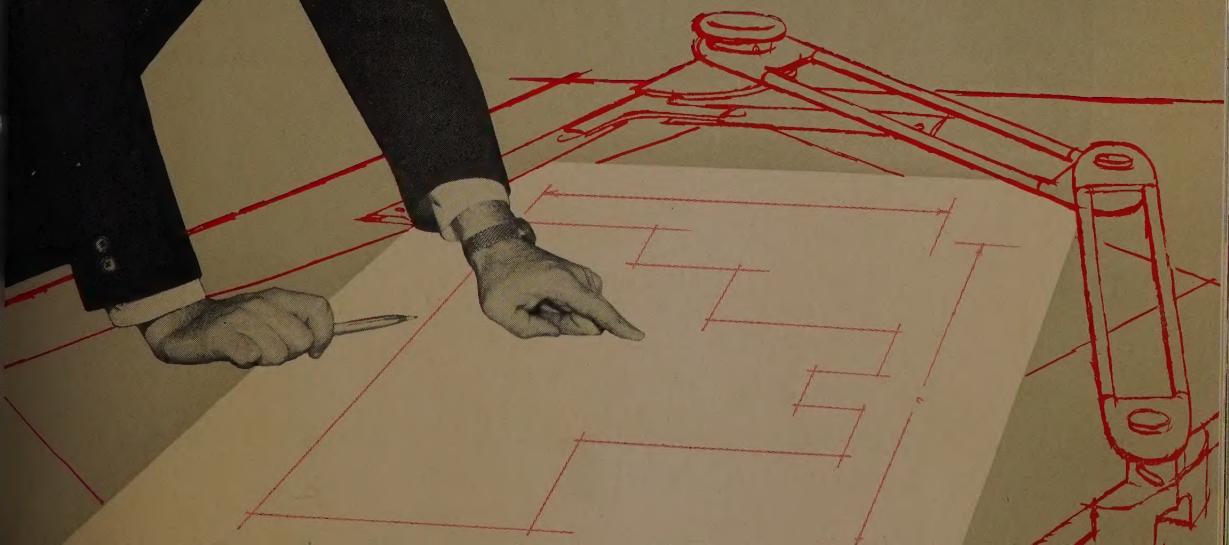
THE WEEKLY MAGAZINE OF METALWORKING



## TOOL ENGINEER MOVES UP

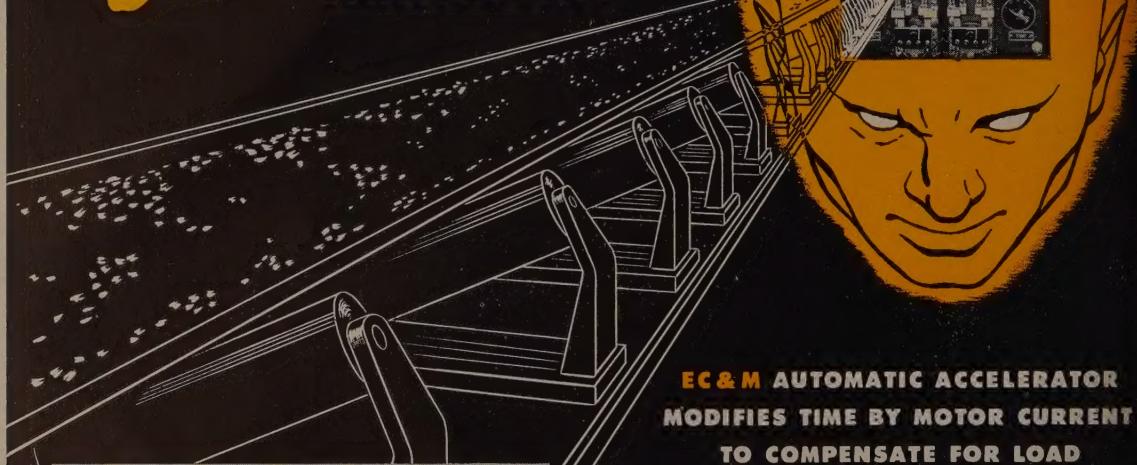
New Voice in Management — p. 136

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# Electronic Brain

CONTROLS WORLD'S  
LONGEST SINGLE-FLIGHT  
CONVEYOR BELT!\*



**EC & M AUTOMATIC ACCELERATOR  
MODIFIES TIME BY MOTOR CURRENT  
TO COMPENSATE FOR LOAD  
AND WEATHER CONDITIONS**



\*11,000-foot rubber belt in  
mile-long conveyor handles  
coke between coking plant  
and blast furnaces at large  
eastern steel mill.

In this installation, the NEO-  
TIME-CURRENT ELECTRONIC  
ACCELERATOR (in white  
circle) is shown on an EC&M  
150 h. p. 440-volt starter.



**THE EC&M NEO-TIME-CURRENT METHOD  
OF ACCELERATION** is not just time limit or  
current limit . . . it actually combines the ad-  
vantages of both to give positive acceler-  
ation modified by load conditions. As its name  
implies, it is inherently self-adjusting and  
automatically provides for (1) fast acceler-  
ation of an empty belt on a hot day and  
(2) slow acceleration of a loaded belt under  
icy conditions.

**NEO-TIME-CURRENT STARTER FEATURES:**

1. It permits use of single motor-drive on long conveyor systems.
2. Belt stretching is controlled within safe limits during acceleration.
3. Convenient adjusting dials can be set for slow start during break-in period and then gradually changed to give most efficient acceleration for best operation.
4. After tune-up, further manual adjustment is eliminated by automatic self-adjusting characteristic of the Neo-Time-Current.

For Details and Specifications,  
Write Today for Booklet 1041.

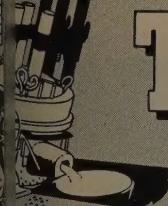


**THE ELECTRIC CONTROLLER & MFG. CO.**

2698 EAST 79TH STREET

CLEVELAND 4, OHIO

# Tool Steel Topics



BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

## BETHLEHEM TOOL STEEL ENGINEER SAYS:

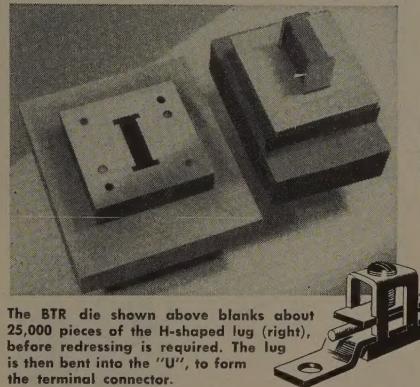
*Be Sure to Heat  
Tools Uniformly*

always been widely recommended that tools be heated uniformly to the hardening temperature. Unfortunately, this is seldom followed.

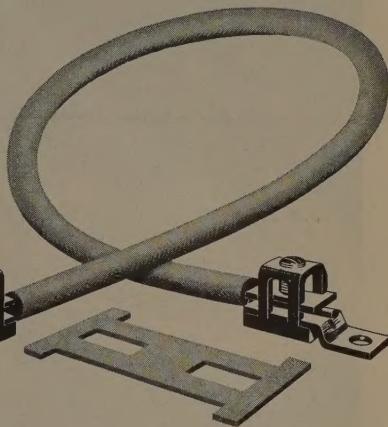
Uniformity is impossible, as the surfaces of a tool must be heated before the interior. The uniformity of heating which results when a tool of constant cross-section is heated, by first heating and then transferring to a furnace operating at the hardening temperature, is generally satisfactory.

However, when a tool of varying section is encountered (for example 1 in. at one end, and 3 in. at the other end), uniformity of heating cannot be attained by heating in open furnaces. What's the answer? Simply pack the tool in cast-iron in a container. Heating through the container occurs so slowly that the tool can be heated uniformly regardless of section dimensions.

The procedure can be followed with all types of tool steels—with one exception. With high-speed steels, cast-iron tips cannot be used because the steel melts at the temperatures used in heat-treating high-speed steels.



The BTR die shown above blanks about 25,000 pieces of the H-shaped lug (right), before redressing is required. The lug is then bent into the "U", to form the terminal connector.



## BTR DIE BLANKS 25,000 LUGS FROM STRIP STEEL BETWEEN GRINDS

One of the parts produced by Pelham Electric Manufacturing Corp., Erie, Pa., is a solderless U-shaped lug, for use on panelboards and switchboards. The lug is blanked from hot-rolled strip steel,  $\frac{1}{8}$  in. thick. Engineers at the Pelham plant selected BTR for the die, and they've had every reason to be pleased with its performance.

The die, operating in a 25-ton press, has a Rockwell C hardness of 60-62. It's economical, because it produces 25,000

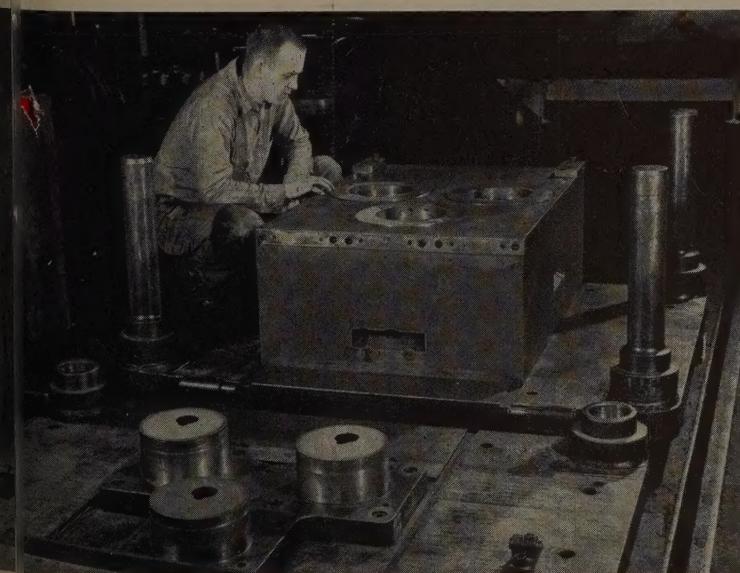
pieces between grinds, with only .008 in. to .010 in. removed in redressing. And it is standing up well on both counts—good wear-resistance and good shock-resistance.

BTR is our general-purpose oil-hardening tool steel of the manganese-chromium-tungsten-vanadium type. In addition to being resistant to wear and shock, BTR has a good reputation for low distortion, and for ease of machining and heat-treatment.

### BTR — TYPICAL ANALYSIS

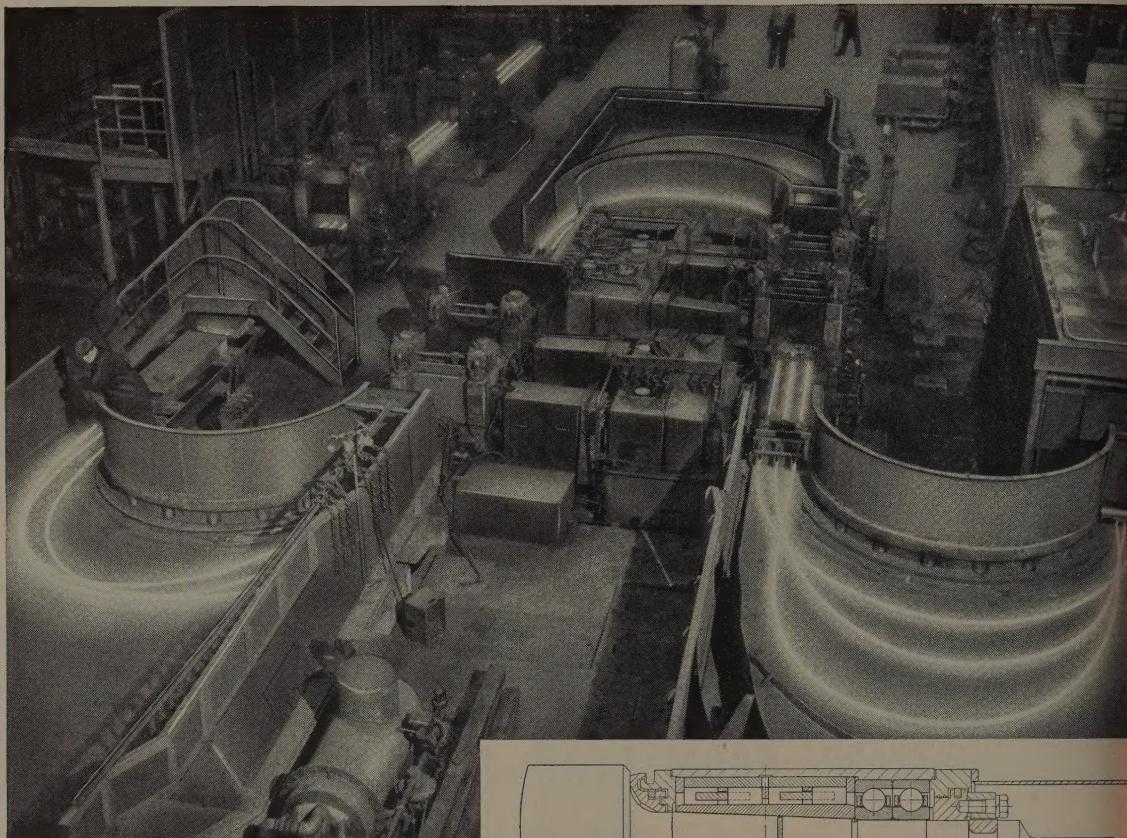
Carbon	0.90	Chromium	0.50
Manganese	1.20	Vanadium	0.20
Tungsten	0.50		

BTR combines abrasion-resistance and toughness, making it suitable for a wide variety of tool-and-die applications.

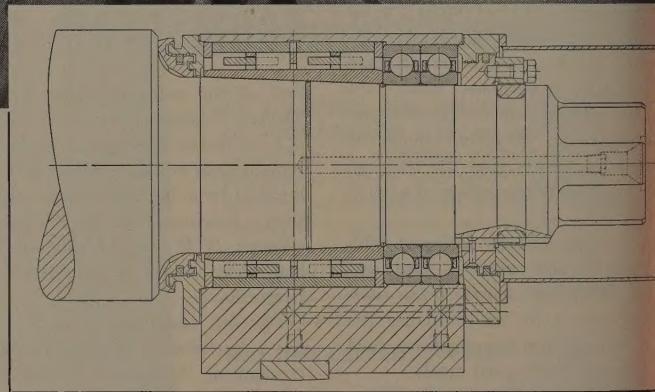


## Big Babies Turn Out Shell Discs

This huge multiple punch-and-die set blanks 90-mm shell discs,  $8\frac{1}{8}$  in. in diameter, from .690 gage, C-1030 plate steel. The punches and dies are made of A-H5 tool steel, hardened to Rockwell C 50 to 55. They turn out about 4,500 pieces in an 8-hour turn, and require but a minimum of redressing. A-H5, our 5 pct chrome, air-hardening steel, is well known for durability, minimum distortion in heat-treatment and easy machining.



**top quality rod  
at better than  
50 miles per hour**



**SKF** Roll Neck as installed in United's Rendleman Mill at Jones & Laughlin. Dotted lines show oil passages for quick, easy bearing removal by the **SKF** pioneered Hydraulic Removal System.

**SKF** multi-row cylindrical bearings installed on the roll necks of the Jones & Laughlin Rendleman rod mill by United Engineering and Foundry Company, are doing an outstanding job at mill speeds of 4700 feet per minute.

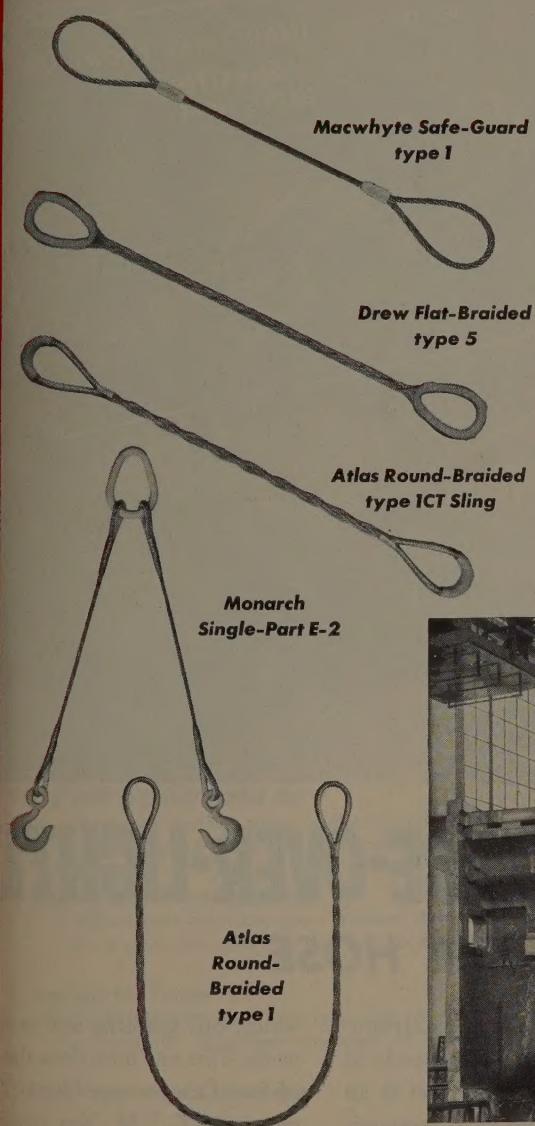
The **SKF** multi-row cylindrical bearing was specifically designed for roll neck applications. This four row grease lubricated bearing incorporates all those necessary qualities for the highest standards of roll neck bearing performance long desired by mill builders.

This is another example of **SKF** leadership in the rolling mill field. Consult **SKF** and have *them* help *you* "put the right bearing in the right place."

**SKF INDUSTRIES, INC.**, Philadelphia 32, Pa.—manufacturers of **SKF** and HESS-BRIGHT® bearings.

7401

**SKF**  
BALL AND ROLLER BEARINGS

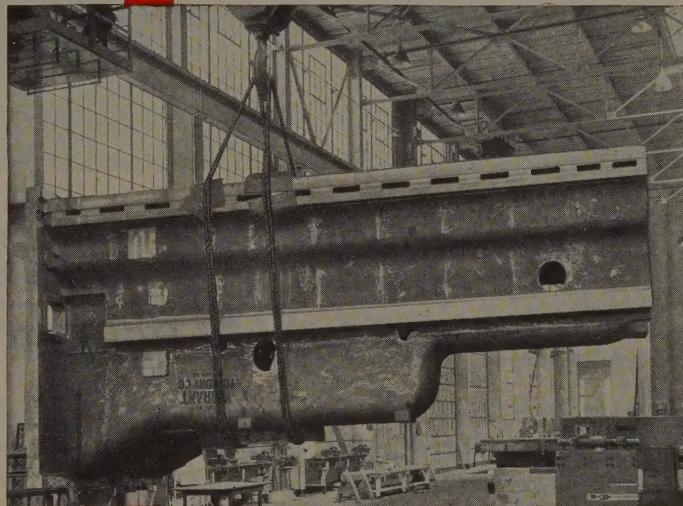


## Macwhyte Slings any type . . . any size your job requires

Here are some of the hundreds of slings available to you. Macwhyte slings cover a full range of sizes and designs in three body types: round-braided, flat-braided, single-part. These slings are made to order with fittings needed.

For greater flexibility, safer gripping, and longer sling life, Macwhyte *Atlas* Slings are "balanced-braided" and (1) Ropes are spliced endless before braiding. (2) Right lay ropes balance left lay ropes. (3) All ropes follow uniform spiral paths, assuring balanced tension throughout the sling body. And under load, there's no kinking . . . no spinning in an *Atlas* Braided Sling.

Macwhyte engineers will study your sling needs and give you the benefit of their broad experience. Ask for recommendations and quotations.



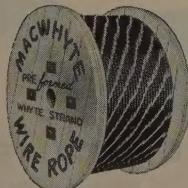
Macwhyte MONARCH Cable-Laid Grommets  
handling large casting

# MACWHYTE SLINGS

Send for Sling Specification Folder No. 5308

cranes and hoists specify PREformed Monarch  
Whyte Strand Crane Rope made by Macwhyte

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Distributors throughout U.S.A.



### MACWHYTE COMPANY

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KENOSHA, WISCONSIN

Manufacturers of Internally Lubricated  
PREformed Wire Rope, Braided Wire Rope  
Slings, Aircraft Cable, Safe-Lock Assemblies,  
Monel Metal and Stainless Steel  
Wire Rope.

1059-S



Ortac—T. M. The Goodyear Tire & Rubber Company, Akron

# GIVING STEEL THE ONCE-OVER-LIGHTLY

calls for ORTAC HOSE

PUTTING the finishing touch on a steel mold is a delicate operation. The mold maker must have complete freedom of movement—complete control over the grinder. That's why the G.T.M.—Goodyear Technical Man—specifies ORTAC for this exacting work.

ORTAC is vertically braided with double end rayon cord. This type of reinforcement gives it high

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And that's not all. This hose can be used for a variety of purposes. ORTAC means "Oil Resistant Tube and Cover." It can handle air,

water, oil, gasoline and most solvents. This one hose does the work of five. Can you use ORTAC? Contact your G.T.M. You can reach him through your Goodyear Industrial Products Distributor or by writing Goodyear Industrial Products Division, Akron 16, Ohio.

YOUR GOODYEAR DISTRIBUTOR can supply you with Hose, Flat Belts, V-Belts, Packing or Rolls. Look for him in the yellow pages of your Telephone Directory under "Rubber Products" or "Rubber Goods."

# GOOD YEAR

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We think you'll like "THE GREATEST STORY EVER TOLD"—every Sunday—ABC Radio Network—THE GOODYEAR TELEVISION PLAYHOUSE—every other Sunday—NBC TV Net

## This Week in Metalworking



Vol. 134 No. 16

April 19, 1954

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## Producers Pare Stamping Costs

### Modern Coil Handling Equipment Widens Use of Low Cost Coil Stock

The battle to keep down costs is going well for producers of stampings. Coil stock and modern coil handling equipment are the decisive factors. Coil stock, with only two scrap ends to its entire length is far more economical than strips of straight stock with two scrap ends to every ten feet. Moreover, the type of coil loading and handling equipment built by F. J. Littell Machine Co. makes coil stock easier to handle than straight stock. Stamping producers are taking full advantage of these developments. Coil stock and Littell Coil Hooks, Reels, Straightening Machines and Automatic Roll Feeds are in wider use today than ever before.

#### Hooks Serve Two Ways

... Littell Hooks make it a simple matter to unload coils on delivery, and to load reels. The variety of sizes have lifting capacities from 1,000 to 40,000 pounds.

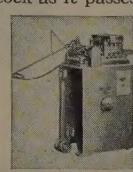


#### Two Types of Reels...

Littell Coil Cradle Reels mount heavy coils, up to 30,000 pounds. Spindle Reels handle coils up to 40,000 pounds. Each type is available in plain or motor driven designs.



**Straighteners Flatten Stock...** Removing curvature from coil stock as it passes from reel to punch press die is the function of Littell Straightening Machines. All models are the same basic design. Variation is in the number and diameter of straightening rollers employed... from 1" to 90" in width, and from .010" to .125" thickness.



**Automatic Roll Feeds...** Press output in many shops has been multiplied five times by simply attaching Littell Roll Feeds to presses for blanking, drawing, piercing, or cut-off work. The Littell Roll Feed is used with compound dies, single station dies, and progressive dies. Standard models are easily attached, serve all types of presses, and handle all standard widths and thicknesses of stock.

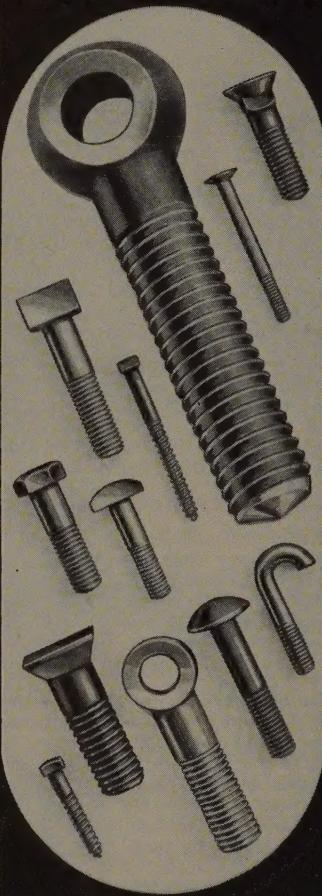
Descriptive details and prices on Littell Hooks, Reels, Straighteners and Roll Feeds are available on request. Inquiries are given immediate attention when addressed to

### F. J. Littell Machine Co.

4103 N. RAVENSWOOD AVE.  
CHICAGO 13, ILL.

# EYE BOLTS

by an  
exclusive method



Among Pawtucket's many specialty products, these lower-cost eye bolts or "swing" bolts are the leaders in this field. Pawtucket's exclusive production method keeps cost low, dimensional accuracy unusually high and strength above standard.

Pawtucket eye bolts are made in standard sizes  $\frac{1}{4}$ " and larger, or to your specifications. In any size, you can depend on a uniform Class 3 fit.

BETTER BOLTS SINCE 1882

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"THE BOLT MAN"  
MANUFACTURING COMPANY  
327 Pine Street - Pawtucket, R. I.  
THE PLACE TO SOLVE YOUR BOLT PROBLEMS  
T.M. REG.

## behind the scenes



### Thank You, Mr. Worfolk

"I'm no mathematical wizard or warlock" writes Mr. Carlton F. Worfolk of Algonac, Mich., "just a 71-year-old free-lance writer—mostly mechano-technical stuff—who keeps his mind young and on the beam by, among other things, scrupulously perusing STEEL, which I consider among my indispensables."

"My wife, who like myself is not young anymore, was not feeling very well this sunshiny-in-Algonac April morning, so I read to her your wood-pecker yarn to cheer her up. She managed to get a good laugh out of it. THANK YOU!"

THANK YOU, Mr. Worfolk, for telling us about it. The smile our wacky words were able to bring to the face of your missus is the most important single accomplishment of our writings to date. Good luck and good health to you both. We'll pass your inquiry on the Heavyside Operational Formula on to one of our technical friends who can read calculus. You do read the stuff, don't you?

### About the May 10 Issue

STEEL's May 10 issue is going to be devoted to bringing you a complete preview of the Basic Materials Show in Chicago, May 17-20.

Irwin Such, STEEL editor, tells us that four important features are being planned for this issue. They are:

1. Plan for Profit with Improved Metals and Alloys . . . a stimulating article which will attempt to drive home the idea that one very important step to increased profits is the selection of the right material for the job to be done.

2. Metal Selection Chart . . . a handy, easy-reference chart including this never before type of information:

a. Latest revised information on engineering alloy and H-steels, including standard, tentative standard and boron grades. These specifications, we are told, will become standard for all government departments and the armed services.

b. A specially prepared list of cop-

per-base alloys showing analyses properties.

c. Complete listing of aluminum and magnesium grades including producer designations, compositions and principal uses.

d. New additions to the list of titanium alloys now commercially available, plus all previously existing specifications.

3. Five Technical Articles on Materials

a. Engineering Alloy Steels  
b. Trends in Development and of Copper-Base Alloys  
c. Trends in Development and of Light Metals

d. Stainless Steels—How Type Selected Affects Fabrication

e. Now You Can Use Titanium It's No Longer a Laboratory Curiosity!

4. The Basic Materials Show

. . . Complete program of meetings and events including: Materials of the Future; Corrosion; New Metal Forming Processes; How, Where to Use Non-metallic Materials; Joining and Materials Management. Also, complete listing of exhibitors and where to find them at the International Amphitheater.

There's a quick outline of an is we think you'll find most useful. member, May 10 is its publication date so be on the lookout for it.

### Get Your Copy Now

Say, you can get copies of that cent series of STEEL articles on learning by dropping a quick note to Readers' Service Department. The final installment appeared in this week's issue and the trio of articles has been packaged into a compact form.

If you want a copy, better write now. From all advance indications they're going to go fast.

Shradlu

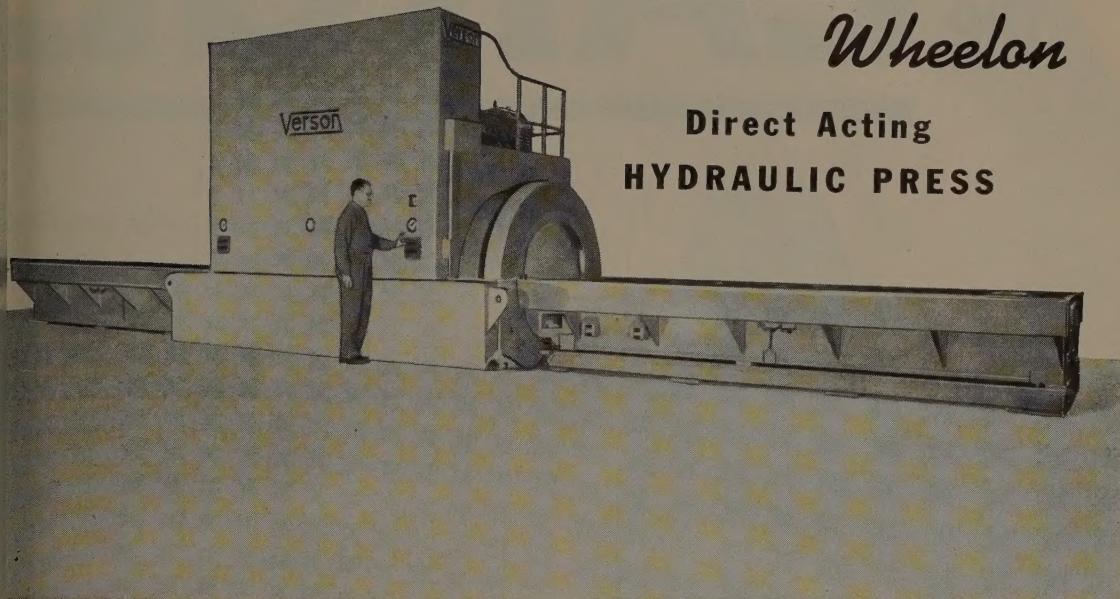
# 21,000 tons

of gentle, squeezing power in this

TRADE **Verson** MARK

*Wheelon*

**Direct Acting  
HYDRAULIC PRESS**



The Verson-Wheelon Bulletin explains the simple operation of the Verson-Wheelon Press and shows examples of the work it performs. Typical specifications are also given. It is available on request.

Yes, this Verson-Wheelon Press has a capacity equivalent to a 21,000 ton rubber pad forming press. However, it does a better, more complete forming job than the rubber pad press; yet its cost is only a fraction of that of the conventional press.

The Verson-Wheelon Press illustrated operates at 5,000 psi. Its twin feeding tables are each 50" x 168" to handle long channels for a leading aircraft manufacturer.

If you are now doing or contemplating rubber pad forming, you should consider a Verson-Wheelon Press before you buy. Compare the price and compare the work—it's the best way to convince yourself of the economy of Verson-Wheelon forming. The bulletin described at the left gives full information. Write for your copy, today.

Verson Press for every job from 60 tons up.

TRADE **Verson** MARK

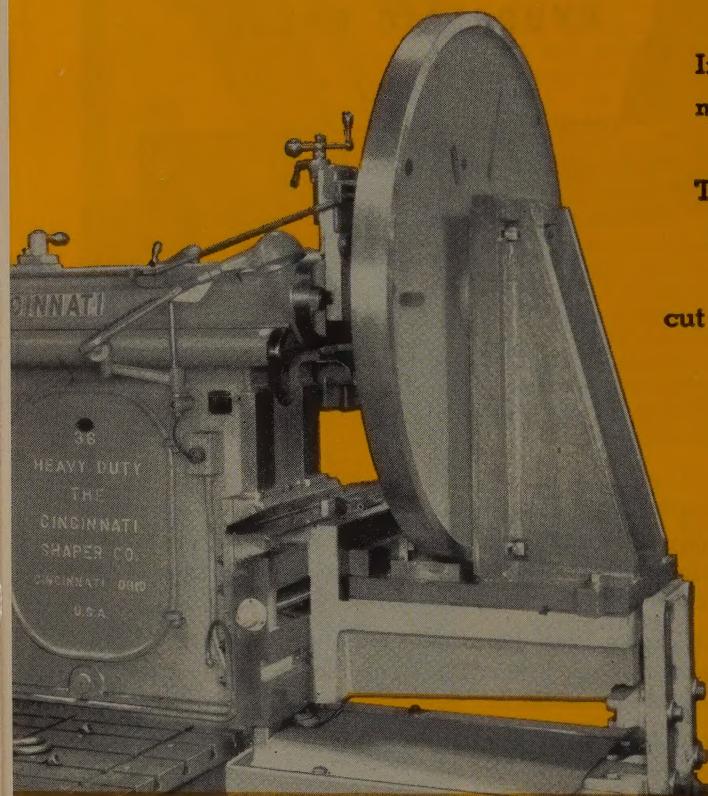
ORIGINATORS AND PIONEERS OF ALLSTEEL STAMPING PRESS CONSTRUCTION

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# INTERNAL SHAPING the LARGE



Internal shaping is the only practical method for many "hard to get at" jobs.

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The low cost fixture and tool make this job profitable and simple.

Other economical internal shaping jobs include—

Internal oil grooves.

Internal contouring.

Internal teeth on special gears.

Internal guides in gate valves.

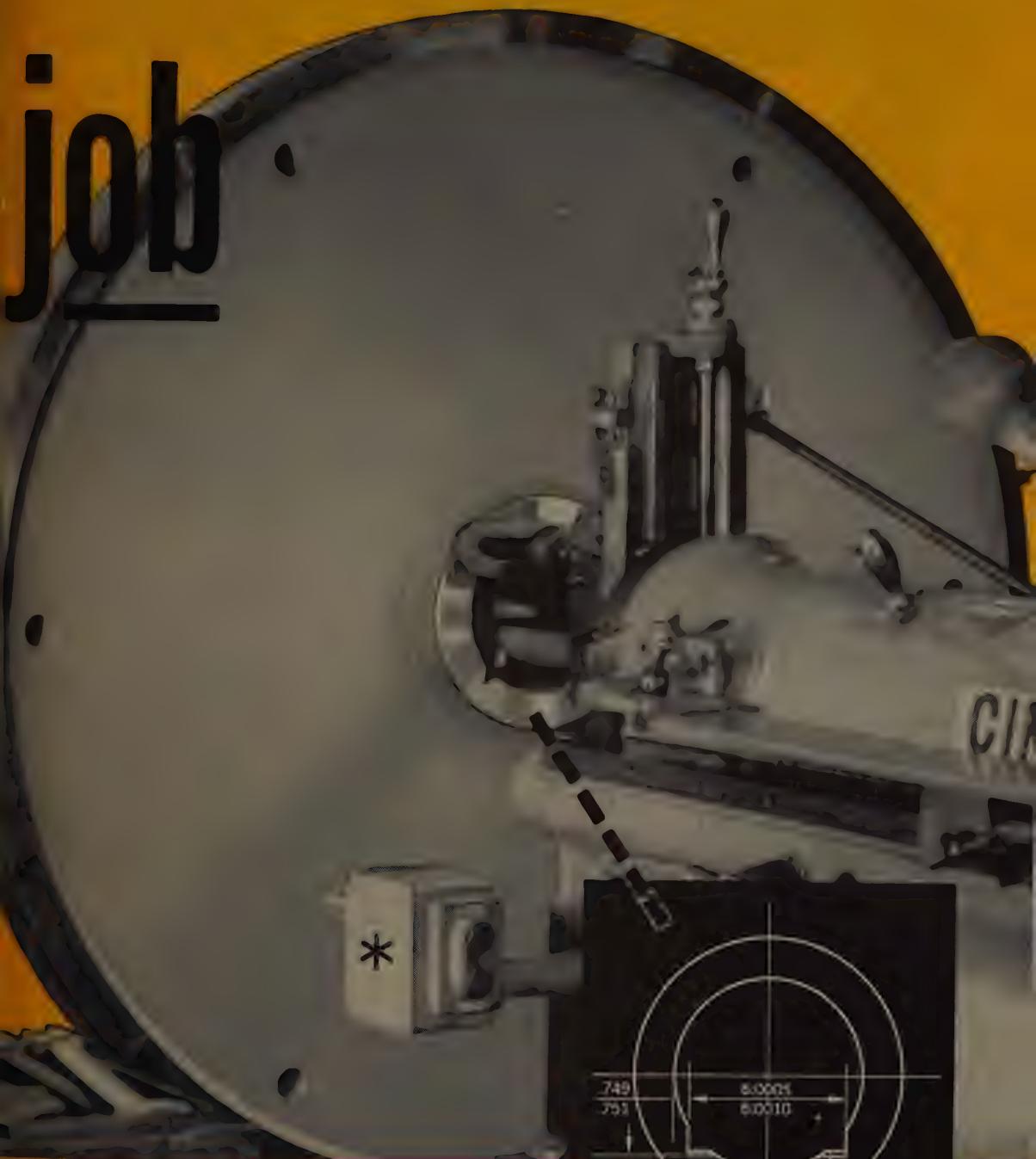
Internal slotting.

Write for New Cincinnati Shaper Catalog N-6.



**THE CINCINNATI SHAPER CO.**  
CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

# job



\* The new Electro-Magnetic Clutch and Brake greatly speeds set-up and operation.



## LETTERS TO THE EDITORS

### Rumors Reach the Editors



Like an evil eye, fire is constantly on the lookout for unprotected hazards such as flammable liquids, electrical equipment, materials in process. Get protection that never sleeps. Guard every hazard in your plant with a Kidde Automatic Fire Extinguishing System.

Quick as a wink, check the 'yellow pages' for your local Kidde dealer.

The words 'Kidde', 'Fyre-Freez' and the Kidde seal are trademarks of Walter Kidde & Company, Inc.

**Kidde**

Walter Kidde & Company, Inc.  
460 Main St., Belleville 9, N. J.

Walter Kidde & Company of Canada, Ltd., Montreal-Toronto

I want to say a word of congratulation on your Mirrors of Motordom column about rumors (Mar. 22, p. 5). Inasmuch as I have spent a good share of my time at Studebaker deaying to that and the other rumors that have sprung up, I feel it high time that such stories be spiked as you have done.

In addressing a local group here several weeks ago, Harold Vance, Studebaker chairman, said there was only one factory in South Bend working a three-shift day, seven-day week—the rum factory.

W. R. Wa  
director public relat  
Studebaker C  
South Bend, I

### Complete Table on Titanium

We would like very much to obtain a copy of the complete list of various annealed titanium and titanium alloys and who makes them, which was contained in your Oct. 12, 1953, issue, p. 170.

Frank G. Frink  
vice presiden  
Washington Iron Works  
Se

• Tear sheets of that table have been sent. However, a new table of titanium alloys now commercially available replaces all previously existing specifications being prepared for STEEL's May 1954, issue. A copy will be sent when available.—ED.

### Instrument Unscrambles Metal

In the Mar. 15 issue there is described on p. 59 an instrument that unscrambles mixed metal parts which is manufactured by the General Motors Corp. We are interested in this product. Will you kindly advise which division of General Motors manufactures this unit?

Frank F. W  
purchasing ag  
Manufacturing Divis  
Chicago Pneumatic Tool  
Garfield, N

• For further information on the instrument, the Thermolectric Metal Comparator, write to the General Motors Research Laboratories, Box 112, North End Station, Detroit.—ED.

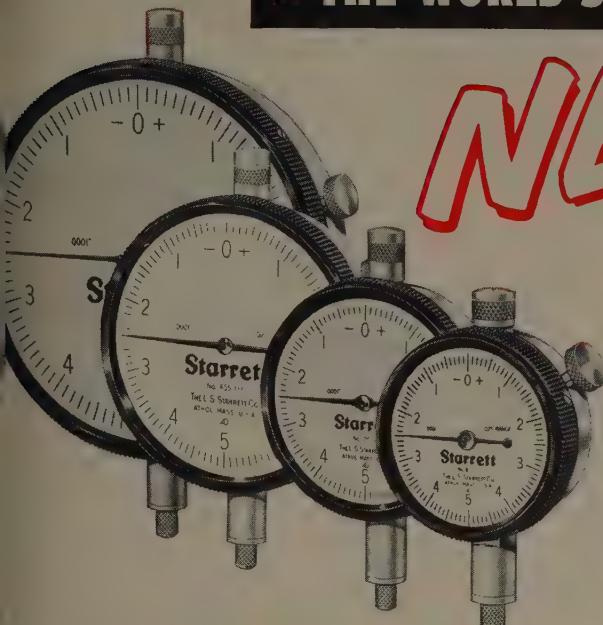
### Rate Cut Exceptions

We are tremendously interested in your article "Railroads Fight for Steel" (Mar. 22, p. 39), dealing with the reduced railroad freight rates in the C

(Please turn to page 12)

# Announcing

## THE WORLD'S MOST COMPLETE LINE



### 140 MODELS

to meet every quality control requirement

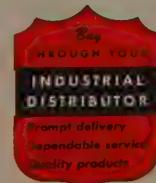
• **STANDARD A.G.D. SERIES** — Four series — No. 81 (A.G.D. Group 1), No. 25 (A.G.D. Group 2), No. 655 (A.G.D. Group 3), No. 656 (A.G.D. Group 4).

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many new Starrett Precision Measuring  
Tools.



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MECHANICS' HAND MEASURING  
TOOLS AND PRECISION INSTRUMENTS • DIAL INDICATORS • STEEL TAPES  
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(Patents Pending)

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for information on Starrett High Precision — Low Friction Dial Indicators.

THE L. S. STARRETT COMPANY, Dept. BG  
Athol, Massachusetts

Please send information on Starrett High Precision — Low Friction Dial Indicators.

Name ..... Title .....  
Company .....  
Street and Number .....  
City ..... Zone ..... State .....



## LETTERS

(Concluded from page 10)

ficial Territory on certain iron steel articles.

It is our understanding these reduced rates were made applicable on items which tended more readily to make freight transportation and attracted motor freight competition. In your article "structural shapes" is shown taking these reduced rates. All information we can get definitely exclude structural shapes.

M. E. Rob  
traffic man  
Bristol Steel & Iron Works  
Bristol,

• You are correct—most structural shapes do not take the new reduced rail freight rates. We should not have used the term structural shapes because that is too broad a term to describe the "shapes unfinished as described in the blanks" which were included in the rate reductions.—ED.

### Refer to STEEL Story



In the last three weeks I have received several calls from people (who had read STEEL) in distress over distortion of weldments.

I quickly referred them to your article "Distortion Can Be Designed Out" (Mar. 8, p. 120).

Soon I am going to the 6th annual spring engineering meeting, American Institute of Steel Construction in Milwaukee. While "distortion due to welding" is not on the printed program, I am certain that it will come up in discussion. Again, I can refer to STEEL.

J. R. S.  
research & welding eng.  
R. C. Mahon  
Dept.

### Thermocouple Gets a Coat

In the Mar. 29 issue we noted Technical Outlook item "Thermocouple Protection" (p. 101) about a protective coating for cast iron thermocouple tubes developed by the Barrows Porcelain Enamel Co. We are very much interested in this development but have been unable to find the address of the company. Please advise.

Robert W.  
Eck Foundries  
Manitowoc, WI

I would like very much to contact the right party on this coating.

Russell H. Coe  
purchasing agt  
Rupert Diecasting  
Kansas City, Mo.

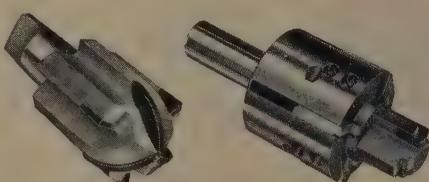
• It's Barrows Porcelain Enamel Co., Langdon and Wiehe Roads, Cincinnati 13.—ED.

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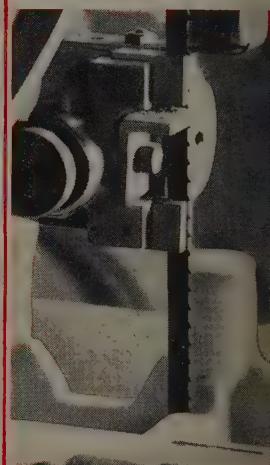
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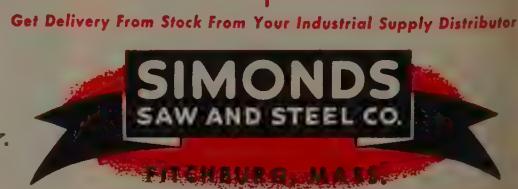
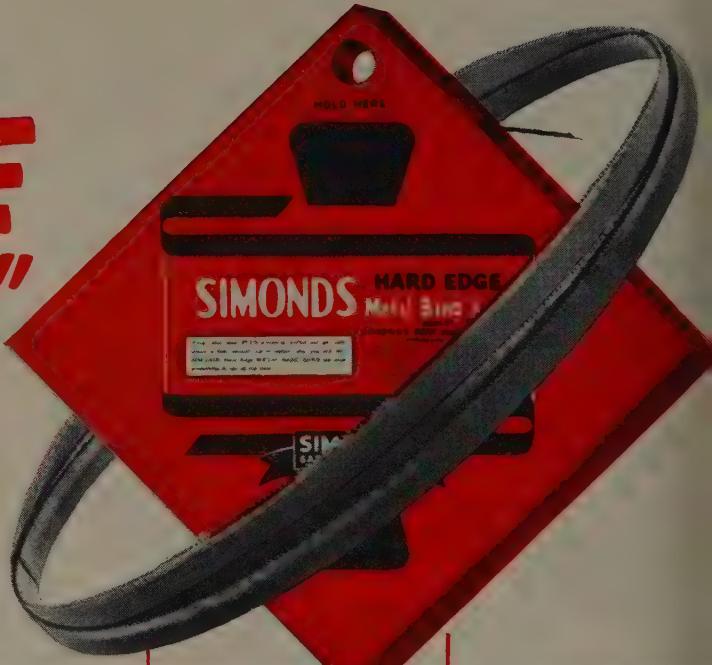
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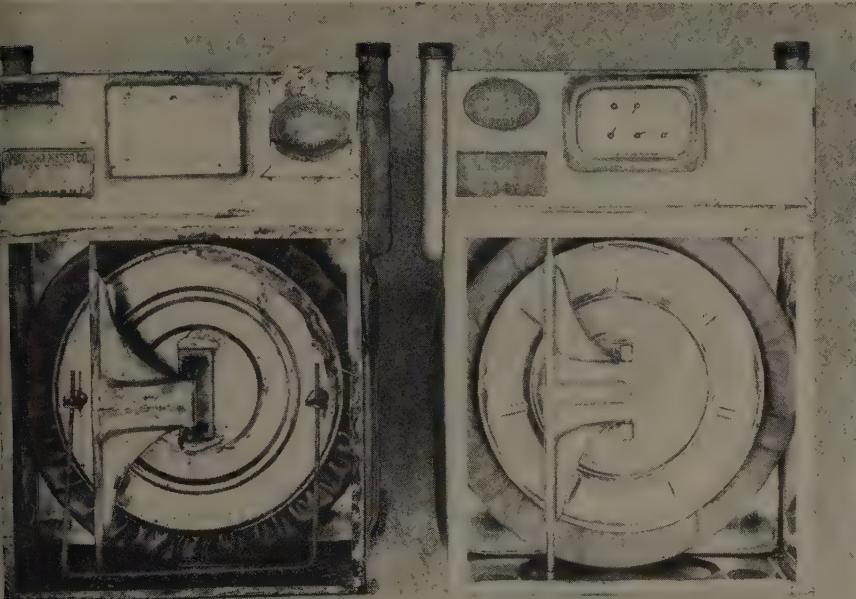


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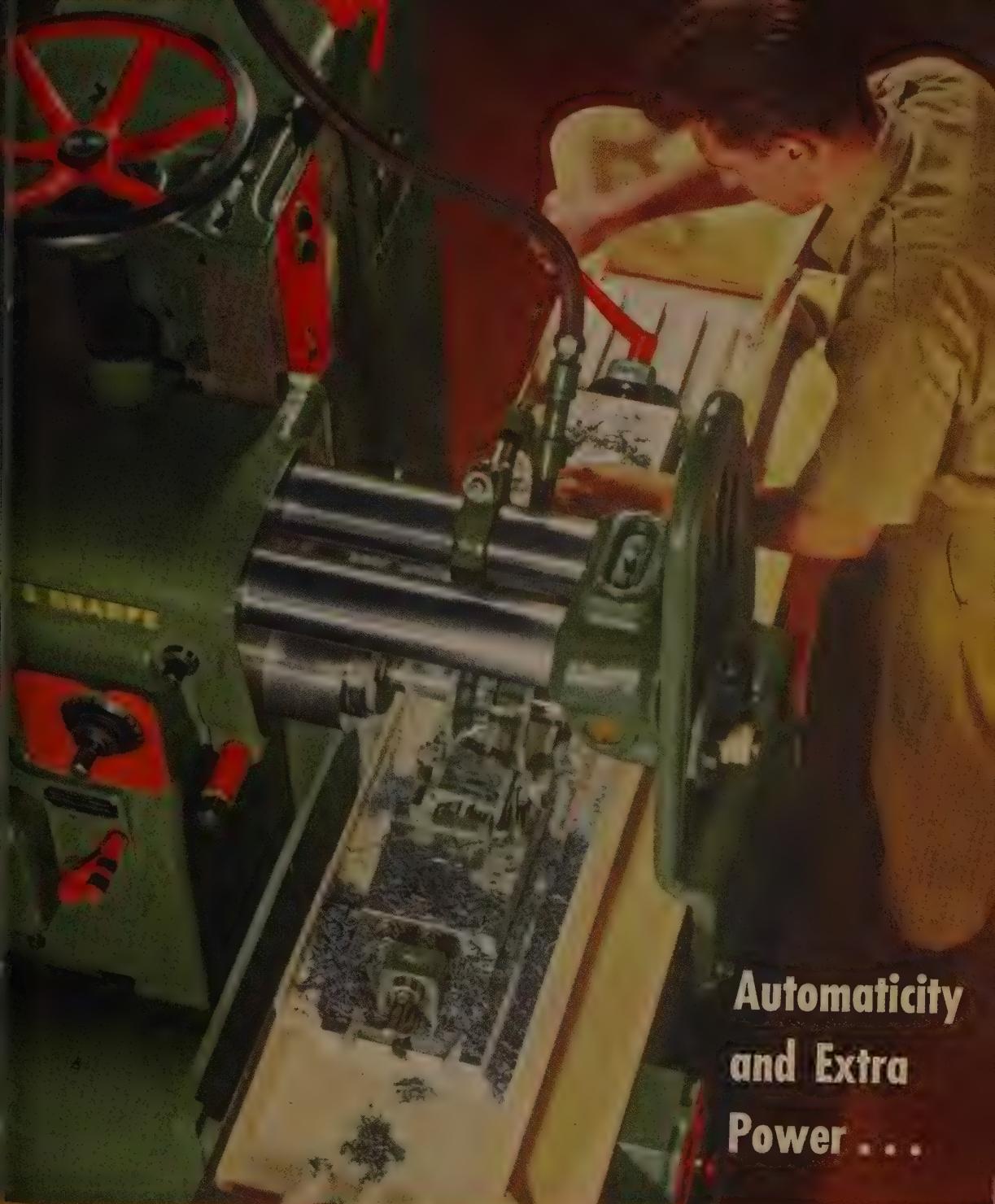
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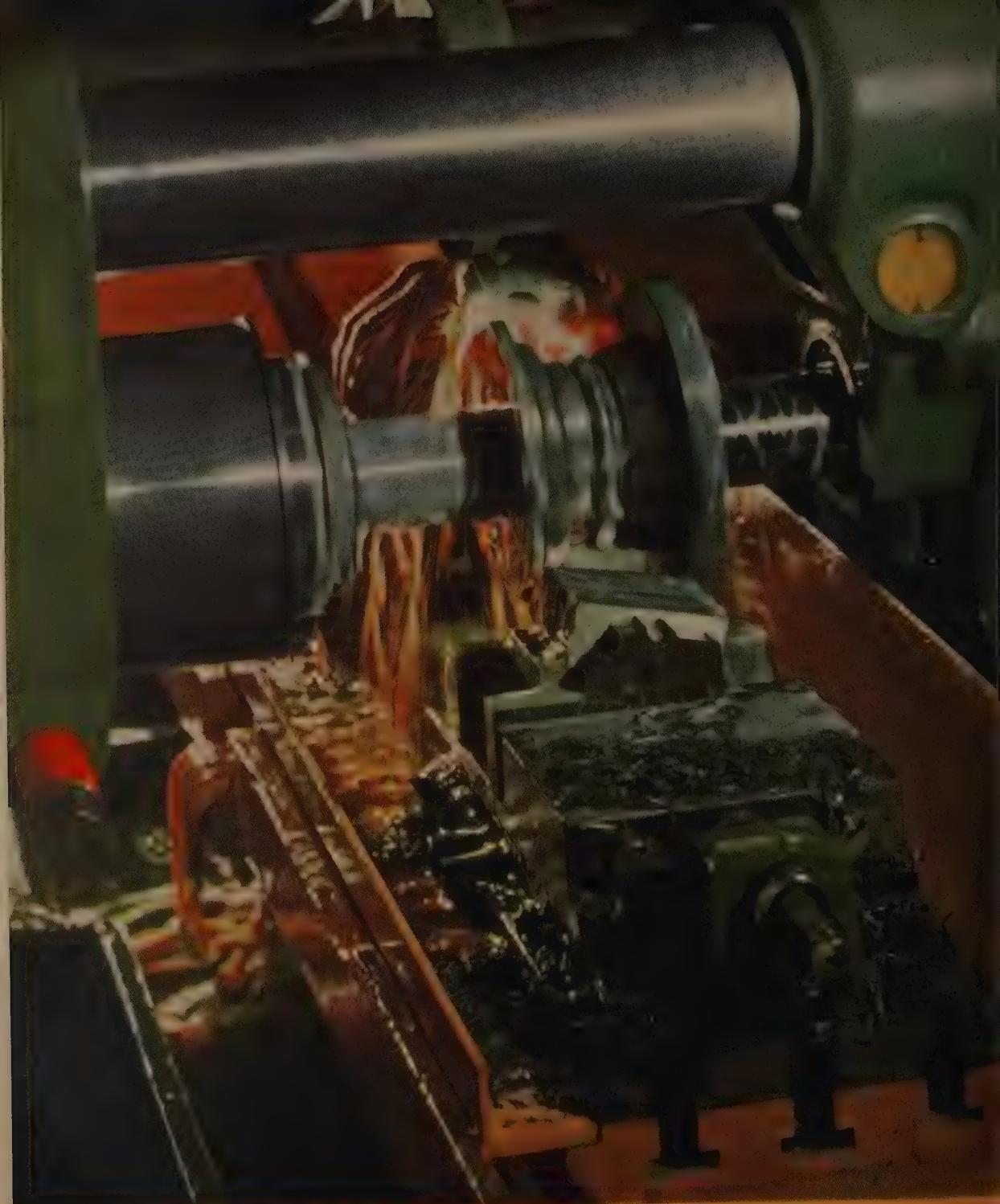
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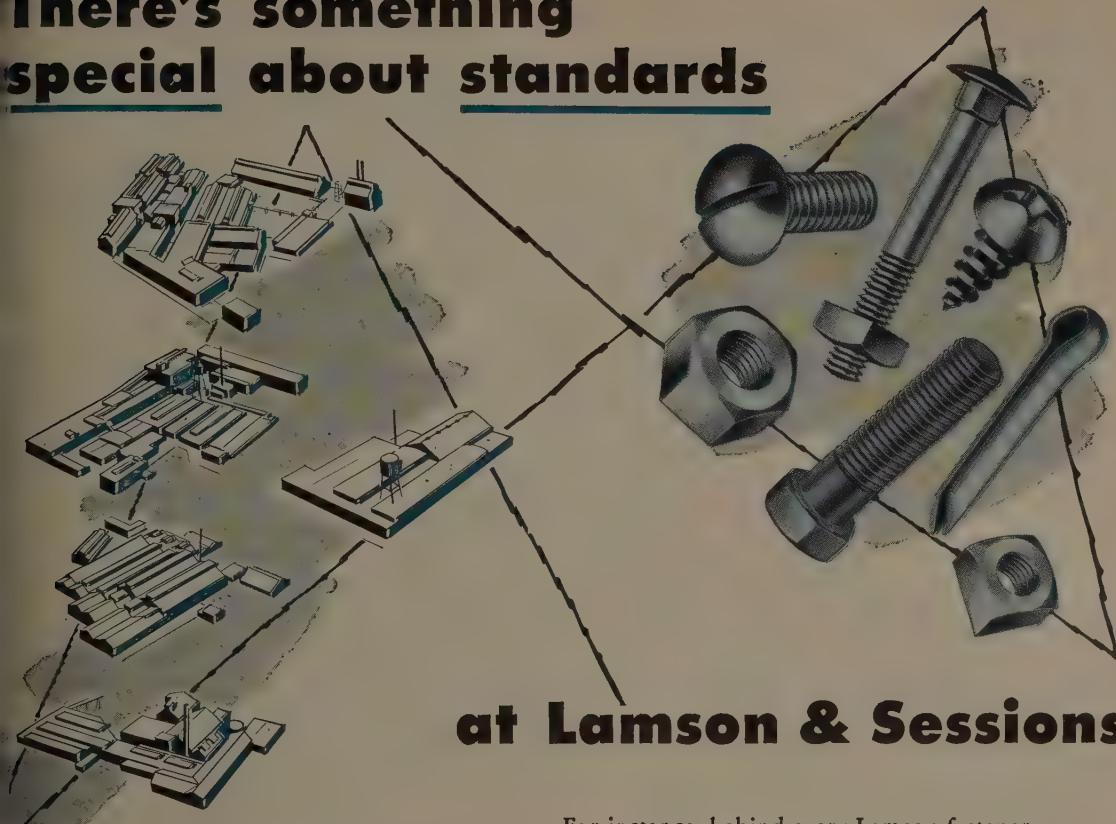
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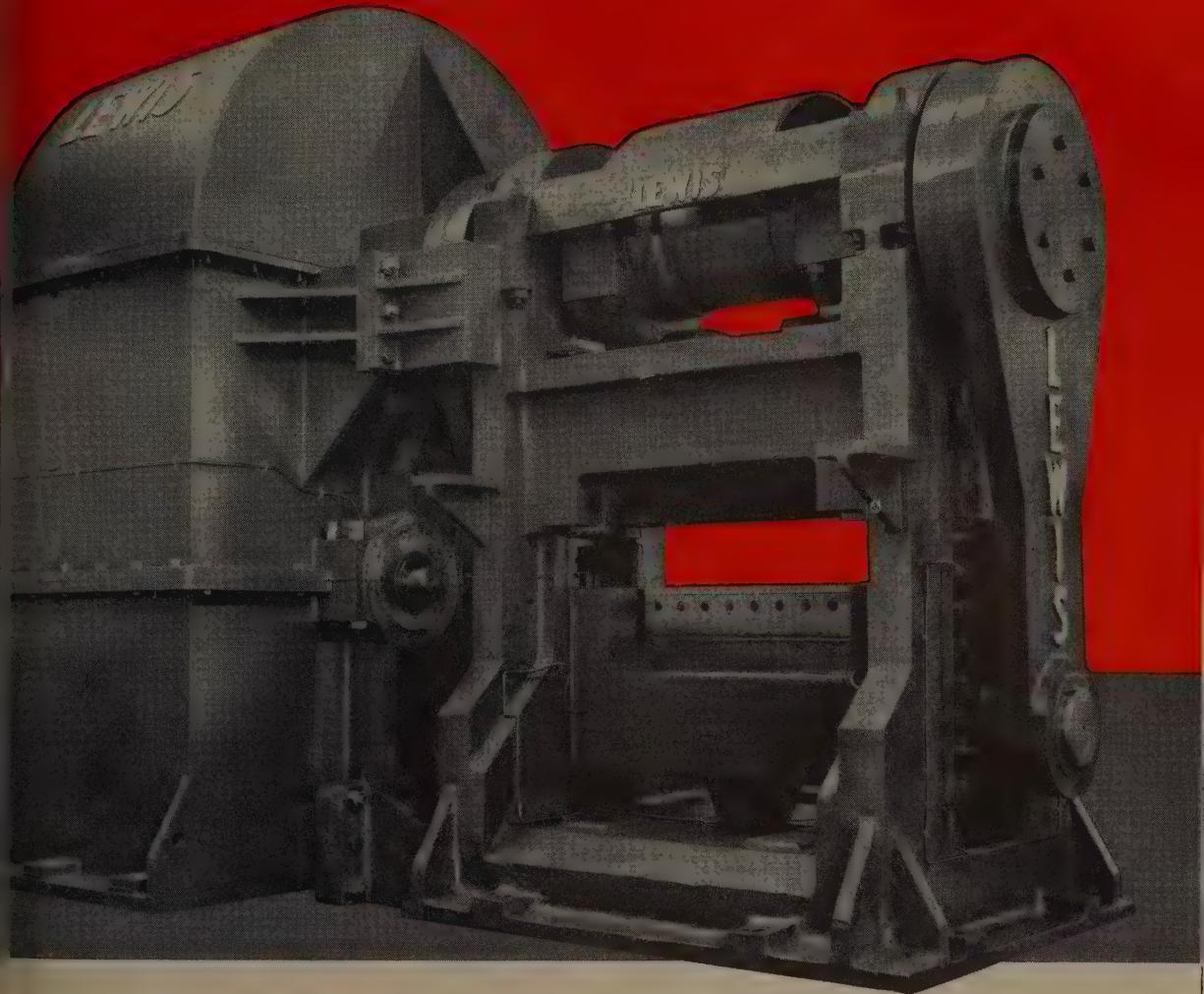
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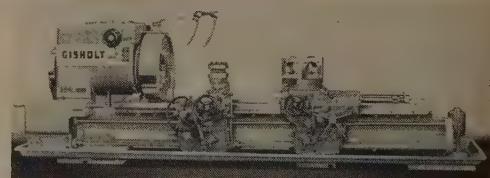


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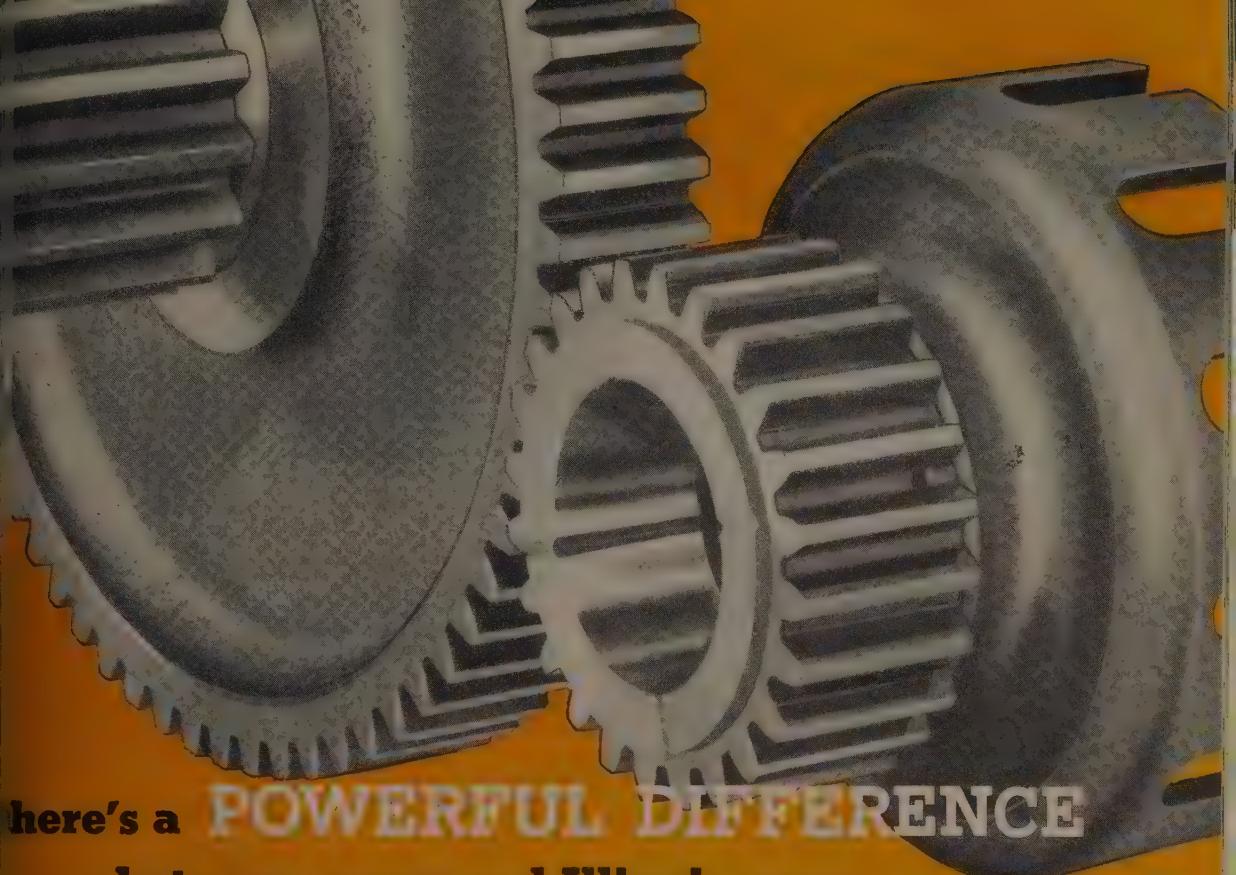
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# CALENDAR OF MEETINGS

18-23, American Ceramic Society Inc.: Annual meeting, Palmer House, Chicago. Society address: 2525 N. High St., Columbus 10. Secretary: Charles S. Pearce.

19-20, Conference on Instrumentation in Water, Sewage and Industrial Waste Treatment, Manhattan College, sponsor. Information: Civil Engineering Dept., Manhattan College, New York 71.

20-21, American Zinc Institute Inc.: Annual meeting, Hotel Statler, St. Louis. Institute address: 60 E. 42nd St., New York 17. Secretary: E. V. Gent.

21-23, American Institute of Electrical Engineers: Annual conference on feedback control systems, Hotel Claridge, Atlantic City, N. J. Information: G. L. Stancil Jr., Beckers, Inc., 723-15th St., NW, Washington.

21-23, National Screw Machine Products Association: Annual meeting, Hotel Statler, Detroit. Association address: 2860 130th St., Cleveland 20. Executive secretary: Orrin B. Werntz.

22-23, Lead Industries Association: Annual closed meeting, Drake hotel, Chicago. Association address: 420 Lexington Ave., New York 17. Secretary Robert L. Ziegfeld.

22-23, The Wire Association: Annual regional meeting, Hotel Sheraton, Worcester, Mass. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

22-24, American Society for Metals: Annual lower lakes regional conference, Hotel Americana, Rochester, New York. Society address: 7301 Euclid Ave., Cleveland. Secretary: W. H. Eisenman.

23-24, National Association of Cost Accountants: Richmond regional conference, Hotel John Marshall, Richmond, Va. Association address: 505 Park Ave., New York 22. Secretary: A. B. Gunnerson.

26-28, American Management Association: Manufacturing conference, Hotel Statler, Cleveland. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

26-28, Metal Powder Association: Annual open meeting and exhibit, Drake hotel, Chicago. Association address: 420 Lexington Ave., New York 17. Secretary: Robert Ziegfeld.

28-May 1, American Society of Tool Engineers: Convention and industrial exposition, Convention Center, Philadelphia. Society address: 10700 Puritan Ave., Detroit 1. Executive secretary: H. E. Conrad.

28-30, Industrial Health Conference: Hotel Sherman, Chicago. Information: Publicity Committee, 1954 Industrial Health Conference, 205 N. La Salle St., Chicago 1.

28-May 1, Grinding Wheel Institute and Abrasive Grain Association: Spring meeting, the Homestead, Hot Springs, Va. Information: Hunter-Thomas Associates, 2130 Keith Bldg., Cleveland 15.

2-4, American Steel Warehouse Association: Annual meeting, Hotel Drake, Chicago. Association address: 442 Terminal Tower, Cleveland 13. President: Walter S. Doxsey.

2-4, National Tool & Die Manufacturers Association: Board of trustees and committee meeting, Hotel Statler, Washington. Association address: 907 Public Square Bldg., Cleveland 15. Executive secretary: George S. Atton.

3-4, American Management Association: Special conference on capital equipment replacement, Hotel Commodore, New York. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

3-5, American Mining Congress: Coal convention, Hotel Netherland Plaza, Cincinnati. Congress address: 1102 Ring Bldg., Washington 6. Executive vice president: Julian D. Conover.

3-5, Association of Iron & Steel Engineers: Spring meeting, Bellevue-Stratford Hotel, Philadelphia. Association address: 210 Empire Bldg., Pittsburgh 22. Managing director: T. J. Ess.

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Western Socket Keys are available singly or in 3 kit sizes individually packed in attractive cloth or plastic cases.

Western Socket Pipe Plugs, made of special electric furnace alloy steel, are available in pipe sizes from 1/16" to 1-1/4"

You get faster assembly of your products plus modern, streamlined appearance — with no protruding bolt heads — when you specify, "Western Socket Screw Products."

Flush-to-surface Socket Screw Products by Western are made of alloy steel, carefully processed on the most modern heading and threading equipment and heat treated in electric atmosphere-controlled furnaces. Precision made, they fit instantly — saving assembly time and money.

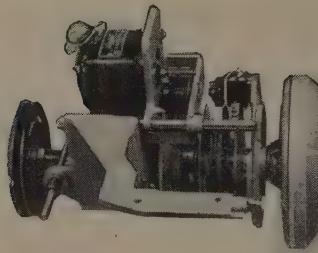
Write today for free catalog and prices.

Western Automatic  
Machine Screw Company

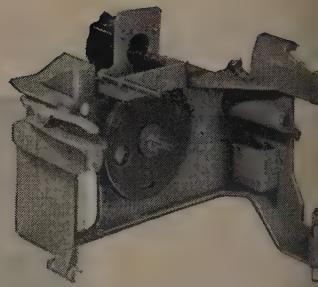
377 Lake Ave., Elyria, O.

Precision Screw Products, Parts and Assemblies Since 1873





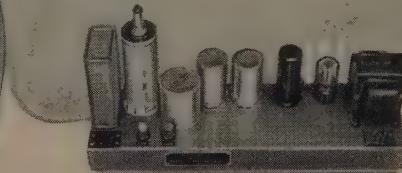
**Reserve Power.** Speedomax can operate at any speed from a whiz to a saunter, because balancing motors are two to four times more powerful than in any other present-day electronic controllers. A heavy load of control and signal cams makes no difference. The long Speedomax shaft and big case can accommodate a world's-record assortment of such accessories.



**Reserve Construction.** You might think all instruments are "de luxe", until you look at a Speedomax. Then you'll see forgings and castings instead of stampings; cut heat-treated gears instead of cast ball bearings instead of sleeves. You'll see aluminum used, to save weight; parts made extra-strong to prevent deflections. You'll see, detail after detail, how rigid construction gives rigid dependability.



**Locked-in Synchronism.** Synchronization of control, recording and signalling actions is permanently fixed because their actuating cams are locked on a common shaft. Obvious? Yes, but in this field a Speedomax exclusive.



**Reserve Sensitivity.** A change of one tenth of one percent of the range is picked up by Speedomax. The instrument therefore, never strains to keep its readings precise, even when the range is short.



**Reserve "Cleanliness".** Speedomax has superb filtering and (when needed) shielding, but neither can guarantee that the electronic recorder's circuit will be unaffected by electronic "junk" from nearby motors, or other equipment. So, we provide a unique "clean" circuit design—and thereby cancel the junk that would otherwise slow down the balancing motor. Net effect is snappy and accurate recording action.

**SPEEDOMAX®**

"Reserved"

**ARE ALWAYS ON THE JOB!**

● You get extra-fine performance, day-in and day-out, from Speedomax Recorders or Controllers because they are full of reserves to meet the "unusual" conditions which can and do come up so frequently. And these reserves of course give low maintenance as well as fine performance.

Why not inspect these evidences of quality the next time you need an automatic electronic potentiometer or bridge. See Catalog ND46(1) and (for circuitry) Tech. Pub. ND46(1). Address our nearest branch office, or 4957 Stenton Ave., Philadelphia 44, Pa.

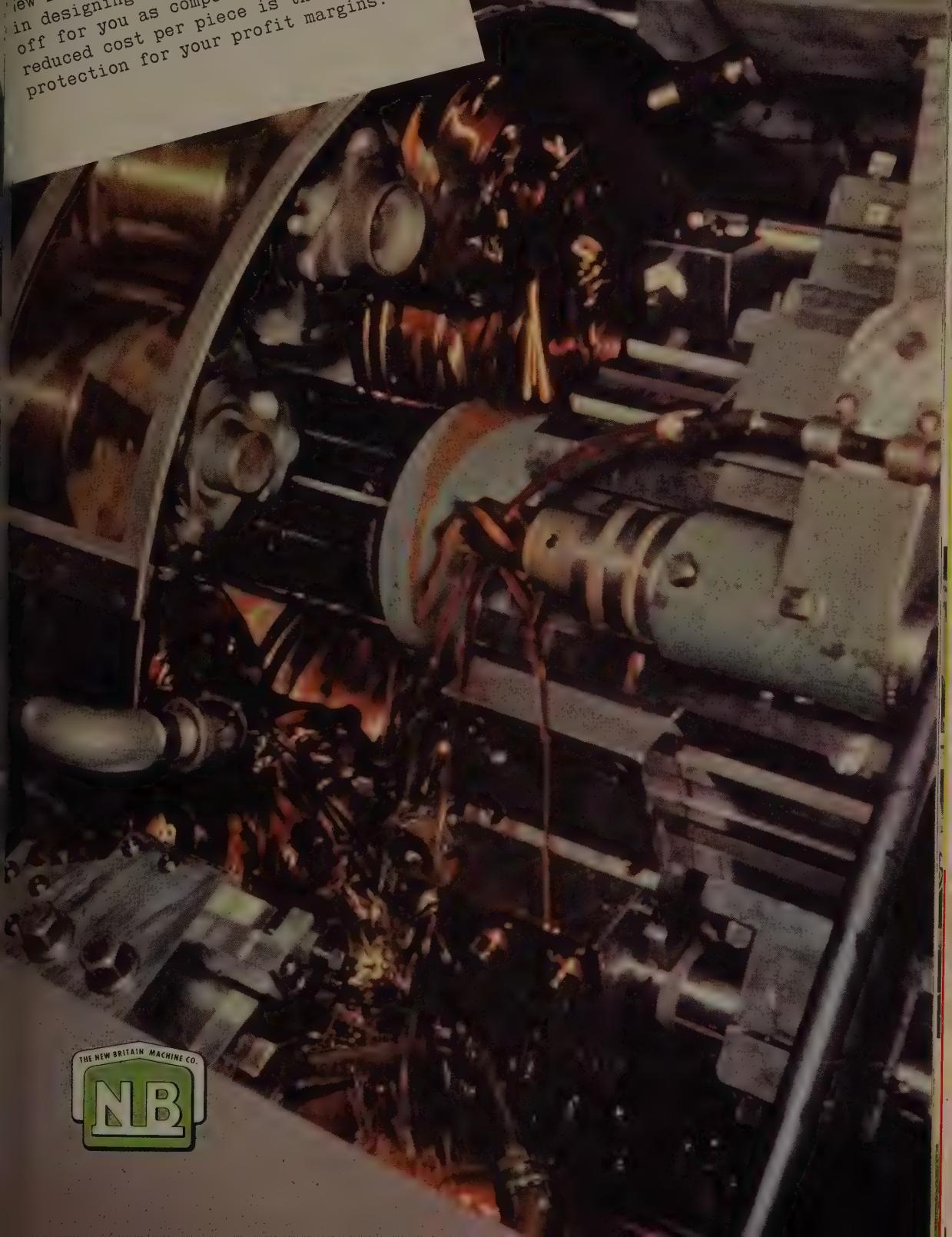
**LEEDS**  
instruments

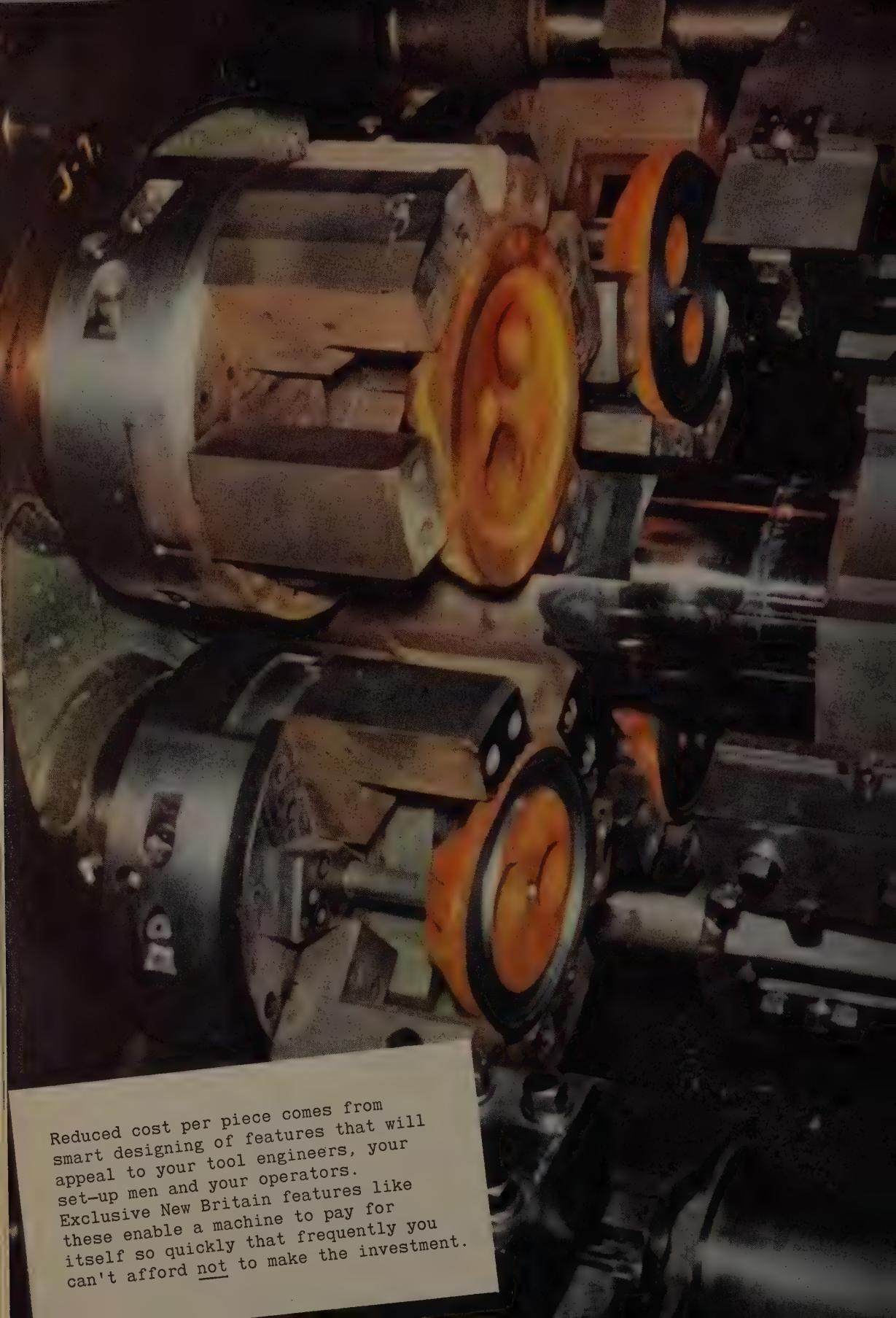


**NORTHRUP**

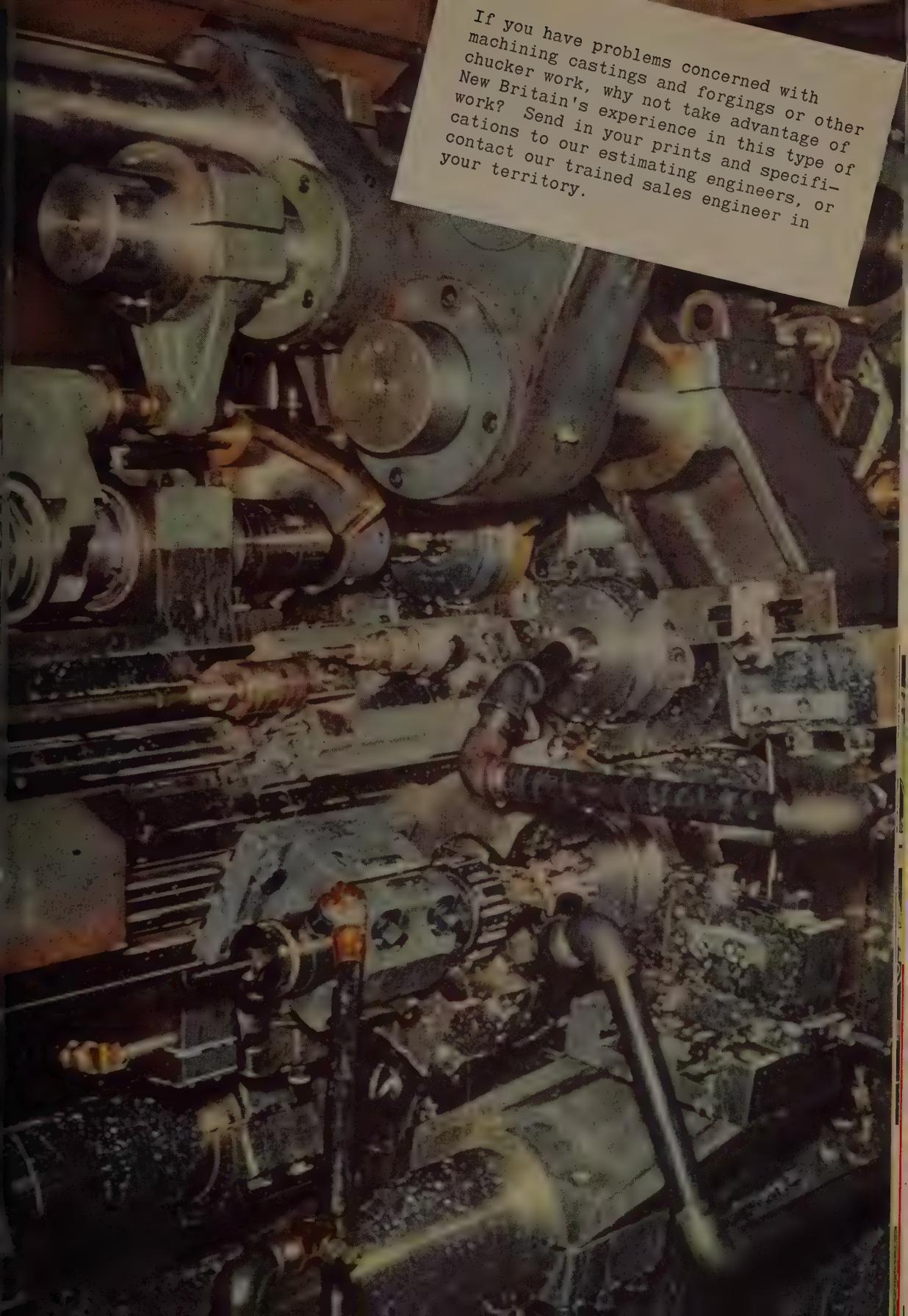
automatic controls • furnaces

New Britain's thirty years of experience  
in designing and tooling chucks pays  
off for you as competition stiffens...  
reduced cost per piece is the best  
protection for your profit margins.





Reduced cost per piece comes from smart designing of features that will appeal to your tool engineers, your set-up men and your operators. Exclusive New Britain features like these enable a machine to pay for itself so quickly that frequently you can't afford not to make the investment.



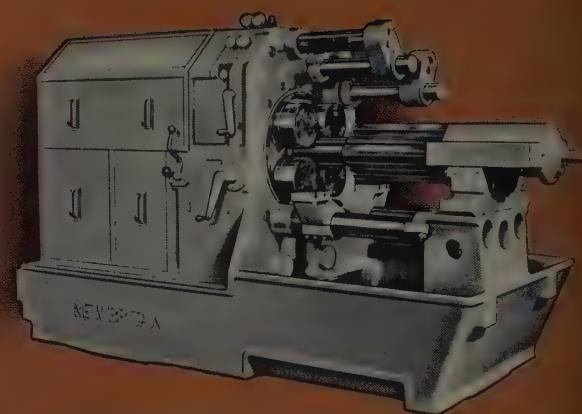
If you have problems concerned with machining castings and forgings or other chucker work, why not take advantage of New Britain's experience in this type of work? Send in your prints and specifications to our estimating engineers, or contact our trained sales engineer in your territory.

# SUSTAINED ACCURACY and PRODUCTIVITY

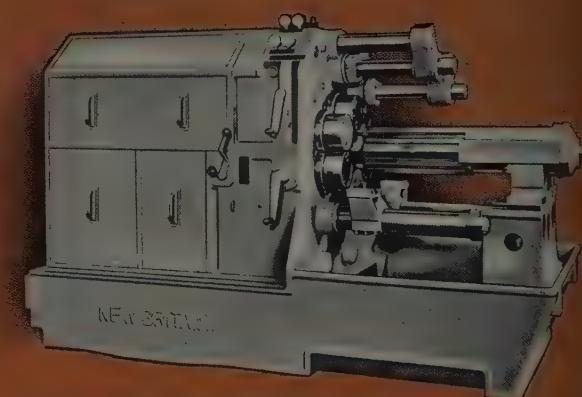
## New Britain open end chucks

feature wide-open accessibility to all tools, and convenient chip removal, with power and rigidity to handle the heaviest cuts. Their high initial accuracy is preserved by such exclusive features as automatic spindle carrier lifting and clamping which prevent wear and weave. Swinging-type forming arms are positionable horizontally and radially without overhang and without exposed surfaces to be affected by grit or chips. They have both radial and longitudinal motion and will handle any length or diameter job within the machine's capacity.

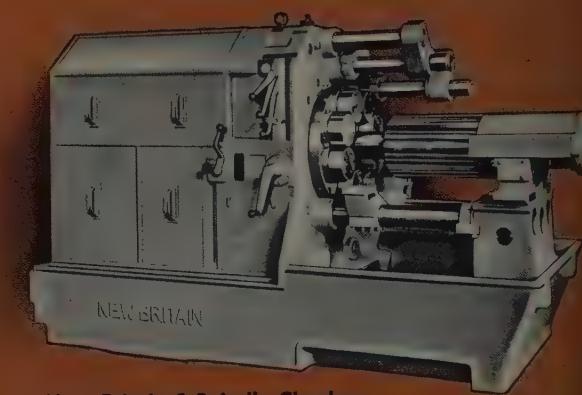
For full information, write us, or consult the New Britain Sales Engineer in your area.



New Britain 4-Spindle Chuck



New Britain 6-Spindle Chuck



New Britain 8-Spindle Chuck

Our general catalog is filed in the Sweet's Machine Tool Catalog File.

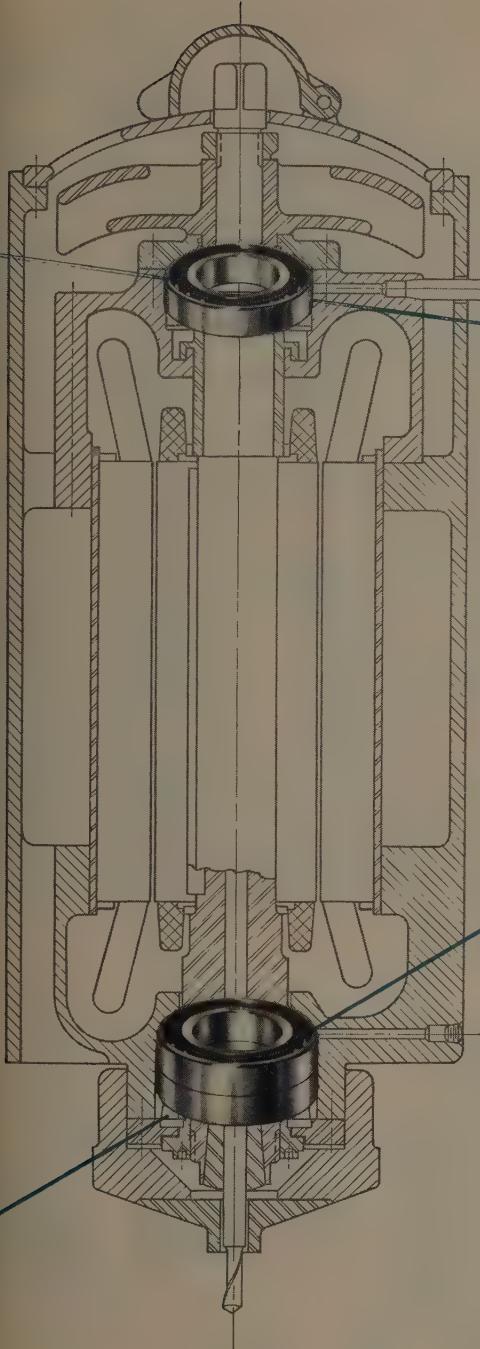


AUTOMATIC BAR and CHUCKING MACHINES • PRECISION BORING MACHINES  
LUCAS HORIZONTAL BORING, DRILLING and MILLING MACHINES  
NEW BRITAIN +GF+ COPYING LATHES

The NEW BRITAIN MACHINE COMPANY

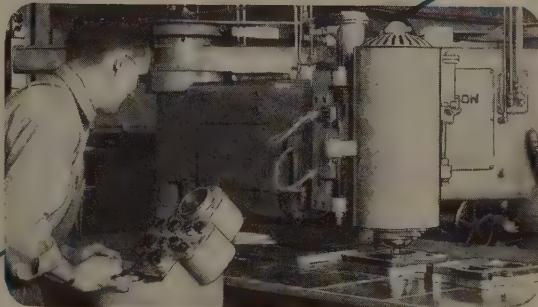
New Britain-Gridley Machine Division, New Britain, Connecticut

Lucas Machine Division, Cleveland 8, Ohio



## LOOKS SIMPLE

WAIT TILL YOU HEAR  
WHAT IT DOES!



High-speed, remote controlled router made by Ekstrom, Carlson & Company, Rockford, Illinois.

You guessed it. This is a blueprint of a spindle head. It shows the arrangement of Fafnir Super-Precision Ball Bearings . . . a single bearing at the top and duplexed bearings at the work end. What's unusual about it? Listen to this . . .

The spindle head is part of an Ekstrom, Carlson high-speed, remote-controlled machine that template routes through 1-inch aluminum plate with a single pass and at cutting speeds as high as 90 inches per minute. It is driven by a 30 h.p. variable speed motor and operates up to 15,000 r.p.m. The radial load on the bearings is as high as 500 to 600 pounds. The spindle head takes tool bits with diameters from 5/16" to 3/4".

Although the top design achievement of this new machine tool is its electrically-controlled hydraulic feed mechanism, the spindle bearing application is no ordinary accomplishment. Fafnir engineers worked hand-in-hand with Ekstrom, Carlson engineers to make it successful. Another example of the Fafnir "attitude and aptitude" . . . a way of looking at bearing problems from the designers' viewpoint, an aptitude for supplying the right bearing to fit the need. The Fafnir Bearing Co., New Britain, Conn.

# FAFNIR

BALL BEARINGS



LINE IN AMERICA

MOST COMPLETE

# "Buffalo" REDUCES METALWORKING COSTS!

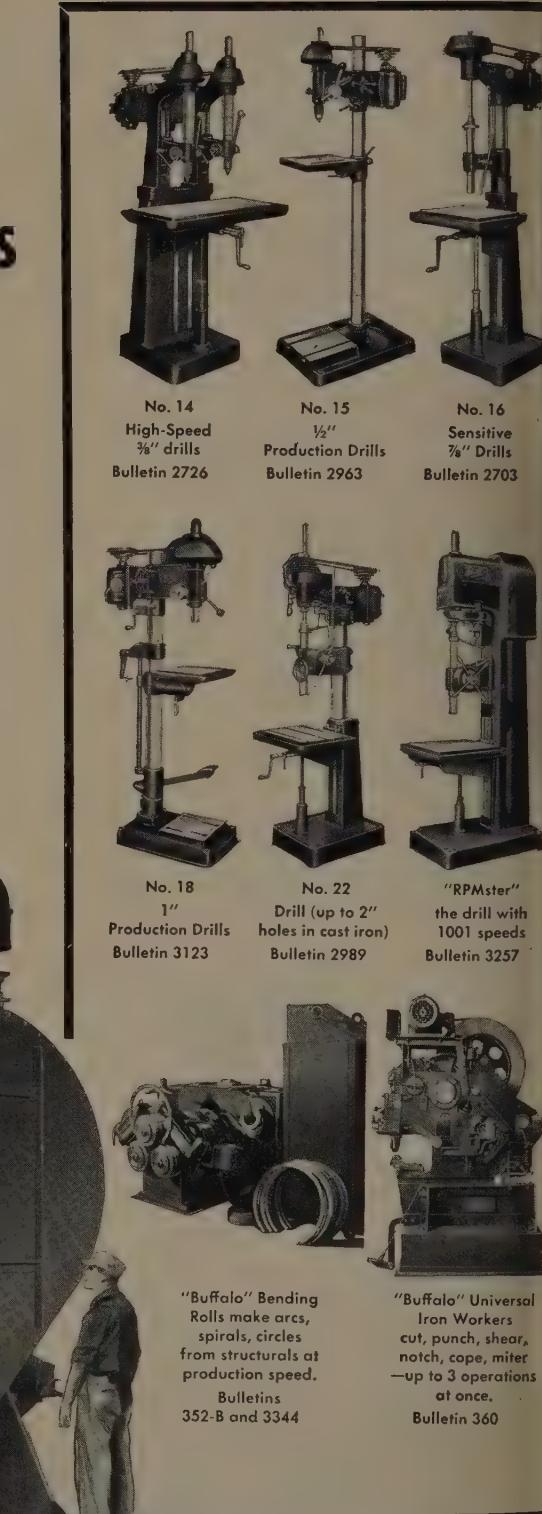
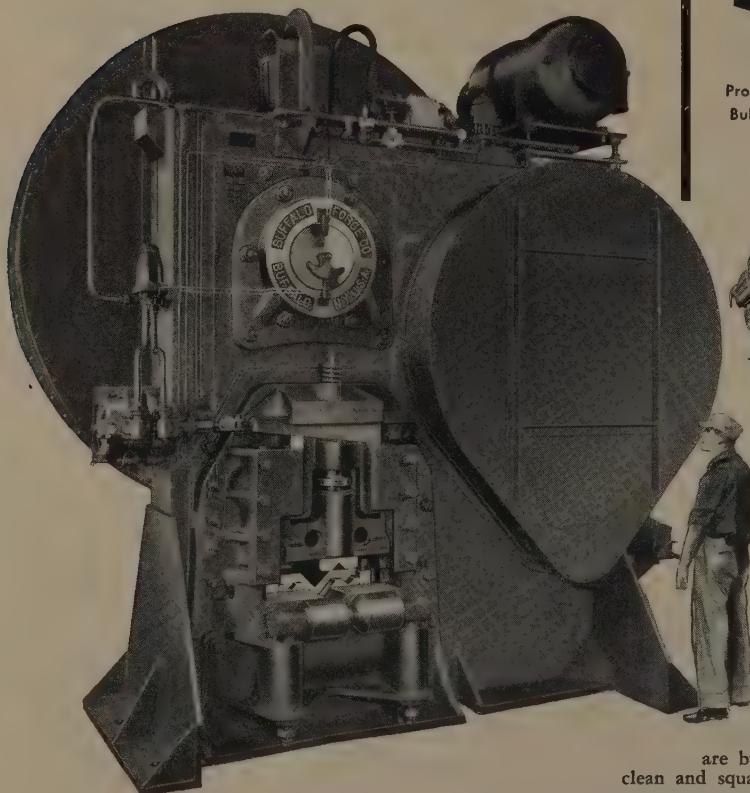
There is a "production-wise" drill, punch, shear, bending roll or wrapping roll in the "Buffalo" line that's bound to speed up your operation. Beside the machines shown here, "Buffalo" builds mill type shears for punching, shearing and blanking; rapid acting punches; riveters; single and double end punches, shears and many others—all easy to operate, all time-savers on setup adjustments, all rigidly and accurately built to stand your heaviest production schedules. Write for bulletins.

## BUFFALO FORGE COMPANY

158 Mortimer St.

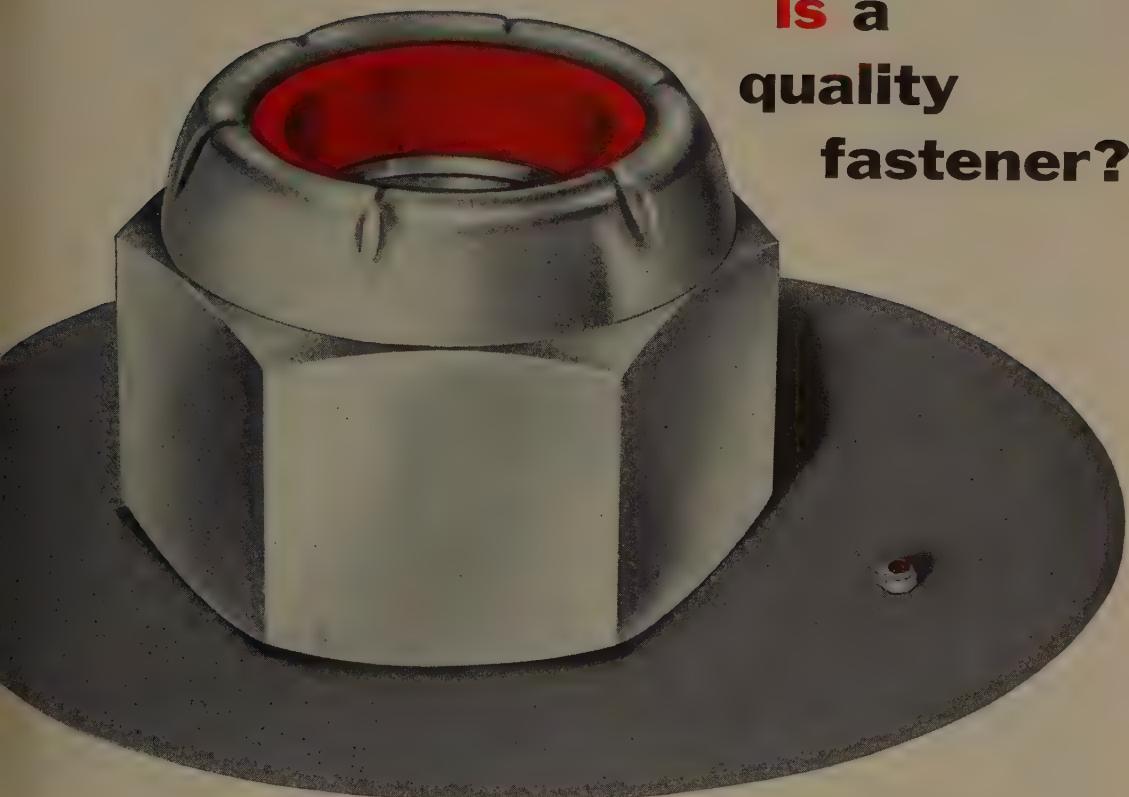
Buffalo, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.



"Buffalo" Billet Shears  
are built in 11 sizes to cut up to 10" rounds  
clean and square — at high rates of speed.  
Write for Bulletin 3295.

# What size is a quality fastener?



Here are two ELASTIC STOP® nuts.

Each has the familiar red locking collar. Each is self-locking, vibration-proof and can be reused many times. Each is a fast, readily assembled one-piece unit . . . will maintain accurate adjustment anywhere on a bolt.

Each will afford positive protection against thread corrosion . . . prevent liquid seepage along bolts. Each is manufactured in quantity. Each is exactly controlled as to quality of raw material, finished dimensions, class of thread fit, seat squareness and finish. Each has a record for precision and uniformly high performance that is unmatched.

But . . . one measures 1/10 inch across the flats; the other, 4 inches. Between these two, there are more than 530 different hex nuts in the ESNA line. They are the result of variations in height, material, finish and size.

Look to ESNA for the top quality self-locking fastener that fits your need best.

## ELASTIC STOP NUT CORPORATION OF AMERICA



Elastic Stop Nut Corporation of America  
Dept. N58-460, 2330 Vauxhall Road, Union, N. J.  
Please send the following free fastening information:

ELASTIC STOP nut bulletin

Here is a drawing of our product.  
What self-locking fastener would  
you suggest?

Name \_\_\_\_\_ Title \_\_\_\_\_

Firm \_\_\_\_\_

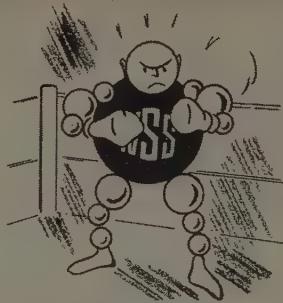
Street \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

pioneering developments keep **WHEELABRATOR® STEEL SHOT** first in abrasives



hardness for  
FASTER CLEANING



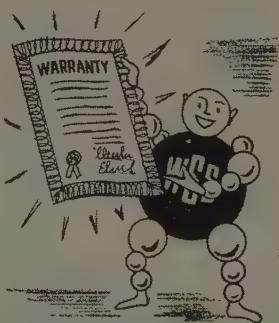
toughness and solidity for  
LONGER LIFE



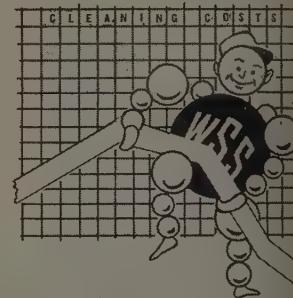
rebound for  
GREATER COVERAGE



always round for  
LOW MAINTENANCE  
COSTS



warranted quality for  
UNIFORM RESULTS



super performance for  
LOWEST OVERALL  
CLEANING COSTS

## ONLY WHEELABRATOR® STEEL SHOT has all these advantages

These are the reasons why Wheelabrator Steel Shot, made from electric furnace steel, has set a new standard for blast cleaning efficiency. The hardness of this super shot (42 to 50 Rockwell C) concentrates the impact of each pellet on the work so that sand and scale are quickly removed. Its toughness and native impact strength considerably reduces shot consumption. All shot is round and solid—free from surface cracks.

Its unique rebound properties cause it to carom from part to part, penetrating and cleaning intricate cavities not reached by other abrasives. Rebounding on impact, it eliminates the problem of imbedment.

The roundness of Wheelabrator Steel Shot drastically reduces parts replacement and maintenance costs. Because it stays round throughout its life, excessive machine wear due to sharp edges is practically eliminated.

Uniformity of carbon content, hardness, micro-structure and screen analysis, obtained through 19 production control checks, is assured by a written warranty. It gives you the same low-cost, highly effective cleaning performance every day of the week . . . every week of the year.

These extra values add up to a SUPER PERFORMANCE that means lower overall cleaning costs for you.

PLUS

50 lb. CARTONS AND PALLETIZING

For Safety—Convenience—And Lower Cost To You

PLUS

A SCHEDULED DELIVERY PLAN

that assures the size and quantity you need  
when you need it!



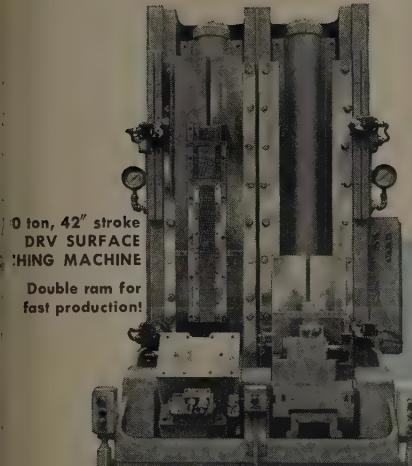
GET THE COMPLETE STORY  
Send today for Bulletin 89-A

**American**  
WHEELABRATOR & EQUIPMENT CORP.

509 S. Byrkit St., Mishawaka, Indiana



STEEL



with this

# RUGGED LAPOINTE

## BROACHING MACHINE

and this

# RIGID\* TIP-DOWN FIXTURE

Send for Bulletin DRV-3

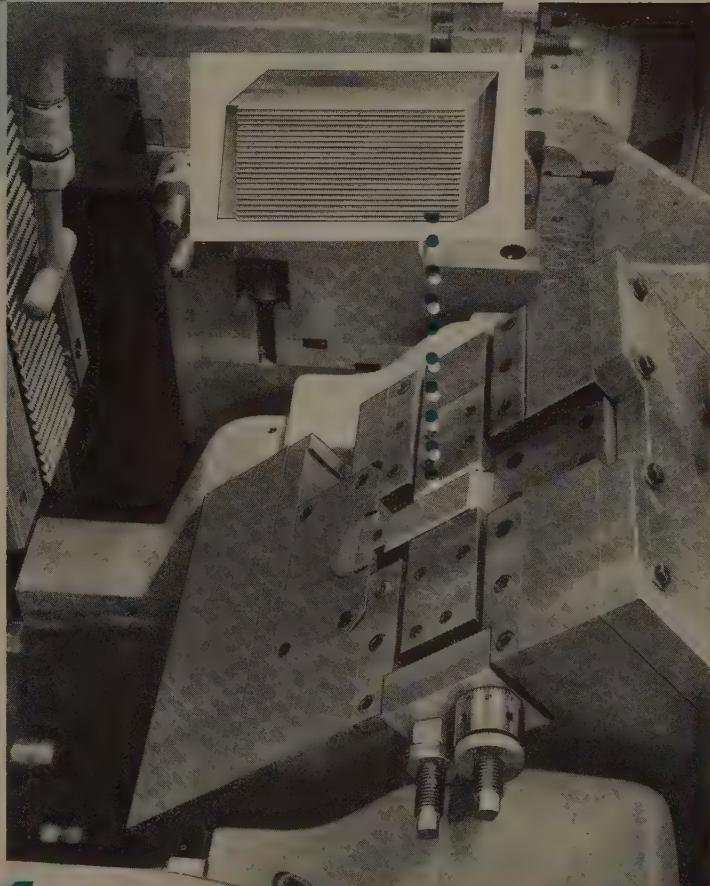
you can  
**BROACH**  
**400**  
high speed steel  
MILLING CUTTER INSERTS  
per hour!

..and here's the exciting news:  
25 different sizes broached  
with minimum interchange  
of adapter blocks.

Inclusive LAPOINTE TIP-DOWN MASTER  
Fixture for safe and convenient  
handling of parts.

Parts are automatically clamped  
hydraulically, but manually released  
for reloading.

Inclusive with LAPOINTE



# LAPOINTE

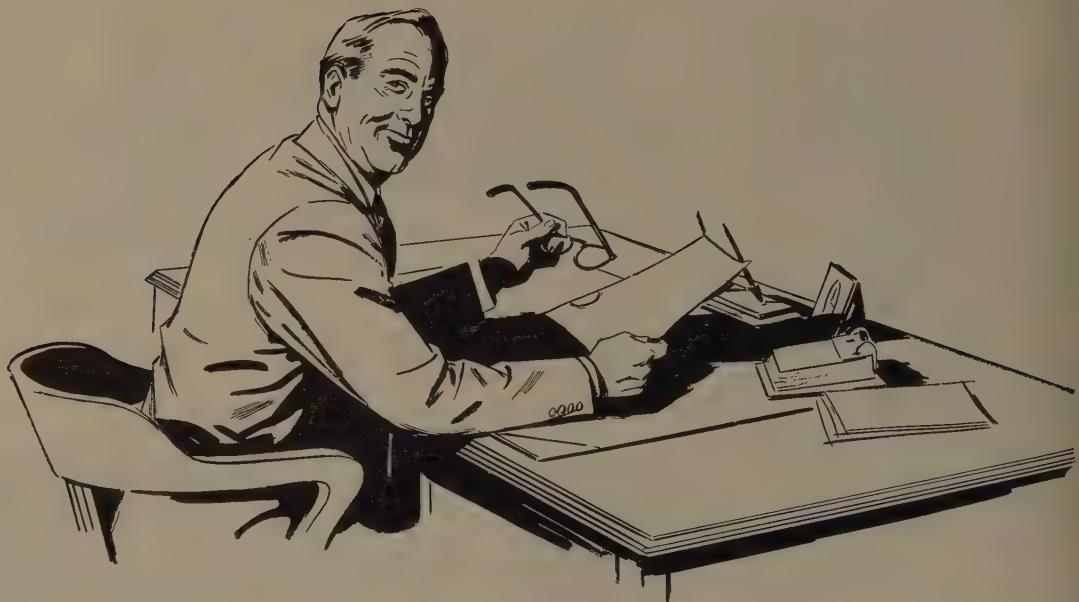
MACHINE TOOL COMPANY

HUDSON, MASSACHUSETTS • U. S. A.

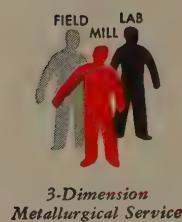
In England: Watford Hertfordshire



THE WORLD'S OLDEST AND LARGEST MANUFACTURERS OF BROACHING MACHINES AND BROACHES



## We admit it...your business is different



That's why we offer a unique metallurgical service to all manufacturers who have steel problems. We know that steels behave in different ways, in different plants, depending upon what your operations are. We know that the solution, whatever it is, must be tailor-made for your production setup.

Our field metallurgist, the first man on this team, goes right into your plant to find out the facts about your particular problems. He talks to your production men and engineers, makes notes.

Information he gathers is discussed with Republic mill and laboratory metallurgists. All three men then focus their combined knowledge of alloy steels, heat treatment, forging and fabrications on your problem. The recommendation they come up with is based on your costs and your equipment.

Many manufacturers who have used this Republic 3-D Metallurgical Service have found ways to increase production, make better products, and cut costs. Perhaps you can achieve these same benefits. A call to your nearest Republic office will start the ball rolling.

### REPUBLIC STEEL CORPORATION

Alloy Steel Division • Massillon, Ohio

GENERAL OFFICES • CLEVELAND 1, OHIO

Export Department: Chrysler Building, New York 17, N. Y.

**REPUBLIC  
ALLOY STEELS**



Other Republic Products include Carbon and Stainless Steels—Sheets, Strip, Bars, Wire, Pig Iron, Steel and Plastic Pipe, Bolts and Nuts, Tubing



**REDIMENTAL FLASH, SPATTER, OR EXPULSION** in welding aluminum or stainless assemblies when you use G-E Slope Control. Shown here applied to a G-E synchronous resistance welding control, this accessory overcomes the disadvantages of only applied welding currents . . . gives longer electrode life and reduces tip pickup. The dial is at left, heat control setting at right.

# Now, Standard Welding Machines Meet Special Production Requirements

with G-E Accessories for Resistance Welding Controls

Added to present equipment or included in your G-E resistance welding control, these special G-E accessories now make possible special production performance with standard machines. They can be used to synchronous or nonsynchronous controls.

Any application requirement can be met with controls . . . correcting for current voltage variations, controlling rate at which current rises to welding temperature or forging, etc.

Complete information on G-E control and control accessories for resistance welding contact your nearest apparatus Sales Office or your welding machine manufacturer, or send in coupon at right.

General Electric Company, Section A790-2  
Schenectady 5, New York

GEA 6075, Accessories for Resistance Welding Controls  
 GEA 5945, Synchronous-precision Control  
 GEA 5916, The Story of Resistance Welding—theory behind the process and complete description of all G-E controls

Name .....

Company .....

Address .....

City .....

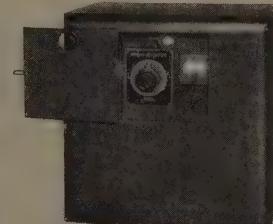
State .....

# GENERAL ELECTRIC

**VE WELD QUALITY**—correct in-voltage variations with G-E Compensating Regulator . . . rms weld current within  $\pm 2\%$ .

**REDUCE REJECTS**—for better, more consistent welds this self-enclosed and completely automatic G-E Current Regulator maintains constant welding current within  $\pm 2\%$  of preset value.

**REDUCE WELD CRACKING** and porosity, eliminate excessive indentation. G-E Up-down Slope Control provides gradual current increase and decrease.





# SIGMA WELDING BOOSTS STEEL FABRICATION 100%

**Average welding speed is 120 in. per minute**—Once clamped, the parts are welded in less than  $\frac{1}{2}$  minute.

**Used as welded**—Free from spatter and flux entrapment, the need for finishing is eliminated.

**Cut costs**—Fewer production steps have made possible labor savings up to  $\frac{1}{2}$  the former costs.

Sigma welding is just one of the welding processes developed by LINDE's research and years of experience. HELIARC, sigma, and UNIONMELT welding form a top notch fabricating team which is now setting a new peak in industrial produc-

A manufacturer of steel truck  
casters, has doubled his production  
from 400 to 800 units a day—  
by changing to sigma welding.

tion. For small shops or huge production lines, from carbon steel to complex alloys and non-ferrous metals—there is the LINDE electric welding process to do the job efficiently and economically. Your local Linde representative will help you determine the best welding process for your job. Call him today for more information.

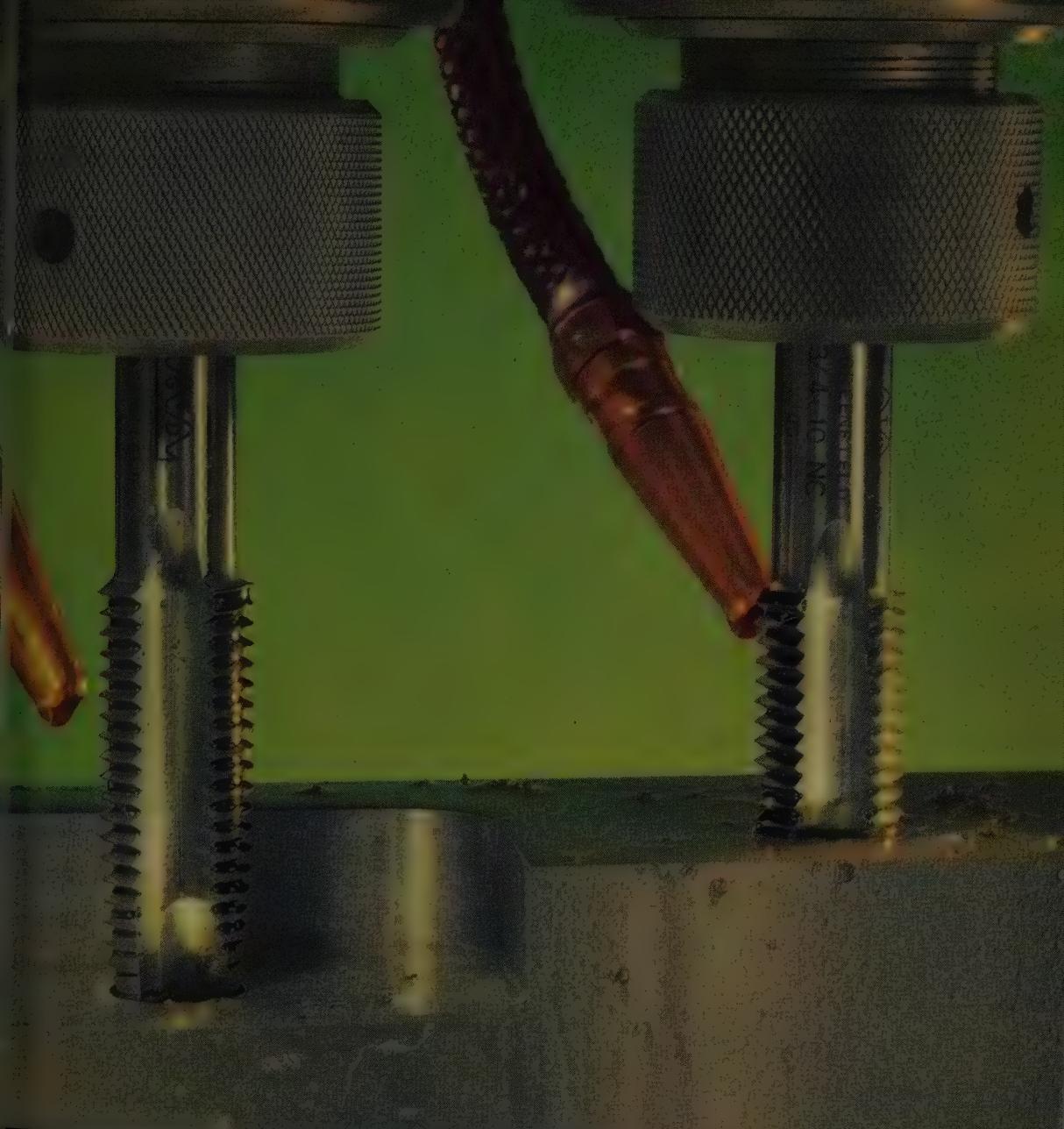
Visit us at Booths 70-77 Welding  
Show Memorial Aud. Buffalo May 5-7

*Linde*  
TRADE-MARK

**LINDE AIR PRODUCTS COMPANY**  
A Division of Union Carbide and Carbon Corporation  
30 East 42nd Street **UCC** New York 17, N. Y.  
Offices in Principal Cities

In Canada: **DOMINION OXYGEN COMPANY**  
Division of Union Carbide Canada Limited

"Heliarc," "Unionmelt" and "Linde" are registered trade-marks of Union Carbide and Carbon Corporation.



**GUN" TAP**, the original spiral pointed tap, was developed by FIELD to lick tap enemy No. 1, breakage due to chips clogging holes. This problem is especially troublesome in "stringy" metals like chip is long and curling.

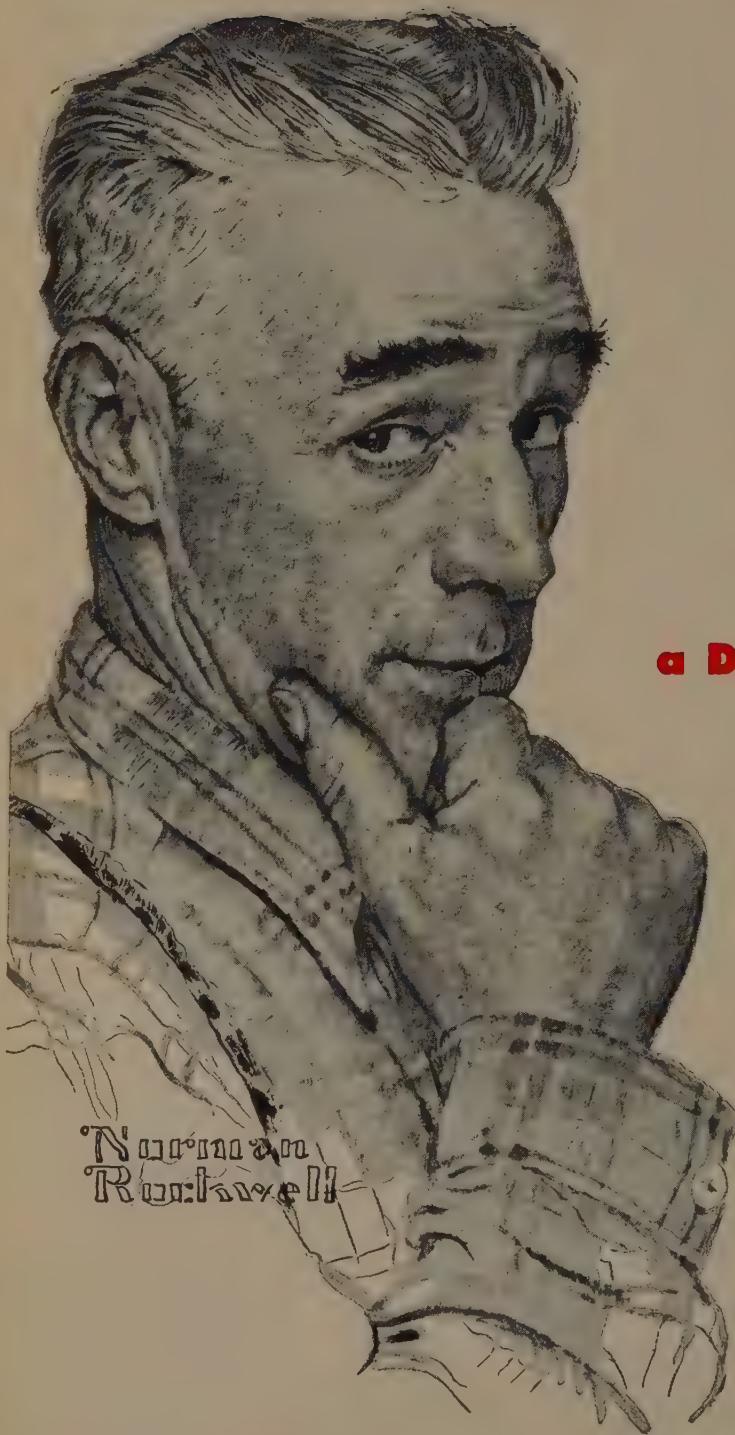
One point solves the problem in through holes by causing the chips to "shoot" out ahead of the tap.

In cases even blind holes can be tapped with the new Bottoming Tap now furnished in machine screw and  $1/4$ "- $5/16$ " sizes.

**ENFIELD TAP and DIE CORPORATION**

GREENFIELD, MASSACHUSETTS





You?...

**a Doubting Thomas?**

IF YOU'RE a man who has to be shown we're right in your corner. Just get Roebling "Blue Center" Steel Wire Rope. One try... see for yourself how it saves time and costs you less on the job.

Two out of three wire rope users in the industrial field prefer Roebling rope. Call the nearest Roebling office for a Field Man to suggest the best ropes for your purposes.



**ROEBLING** CF

A subsidiary of The Colorado Fuel and Iron Corporation

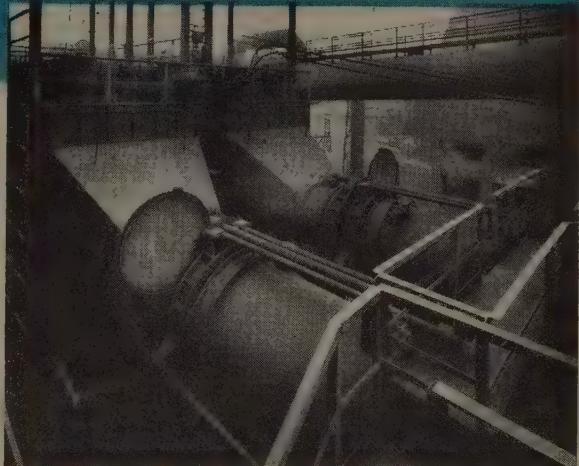
JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROEBLING RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLVD. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICES: TRENTON 2, N. J.

Industrial  
Gas Mains  
6" to 120"

...are best controlled by

*Bailey*  
GOGGLE VALVES

PROVED SAFE AND EFFICIENT ON GAS WASHERS,  
BLAST FURNACE MAINS, PRECIPITATORS, BOILER PLANTS

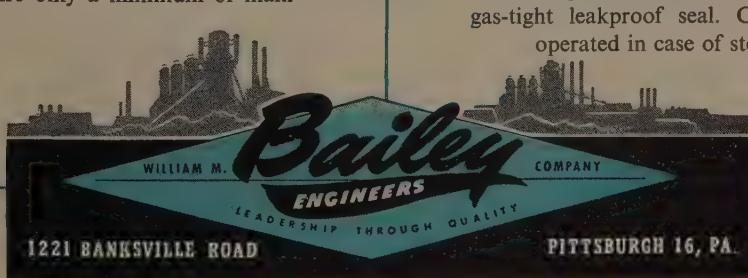


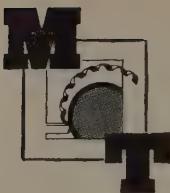
### Mechanical Type

By means of a powerful clamping force applied equally at all points around the disc periphery, the Bailey Mechanical Goggle Valve provides a safe, tight seal for gas mains from 6" to 72" in diameter. The goggle plate is freed instantly by the same powerful mechanism, regardless of the length of time between operations. Both this type and Bailey Thermal Expansion Valves require only a minimum of maintenance.

### Thermal Expansion Type

Designed for gas mains from 36" to 120", the Bailey Thermal Expansion type goggle valve operates by the linear expansion and contraction of three sets of steel tubes. When steam is applied, the tubes expand and separate the flanges, thereby freeing the goggle plate for swinging to open or closed position. When steam is removed, normal cooling contracts the tubes, which then clamp the flanges together to form a gas-tight leakproof seal. Can be hand-operated in case of steam failure.





This symbol identifies the National Machine Tool Builders' Association—a group of 196 manufacturers of machine tools. 148 of these companies, or 3 out of 4, are using Garlock KLOZURE Oil Seals.

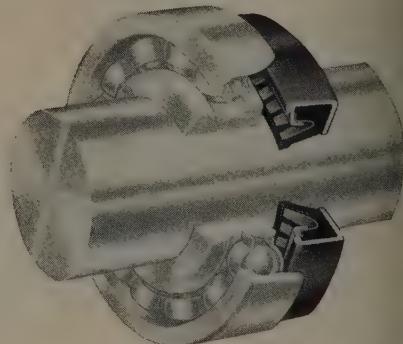
3 out of 4

# Machine Tool Builders use KLOZURE\* OIL SEALS

*Here are 3 reasons why—*

1. The KLOZURE Oil Seal is a precision-made product, so necessary for all components of the tools which are designed for fine precision machining.
2. KLOZURES are *uniform*—both in sealing contact and in spring load.
3. KLOZURE Oil Seals are extremely *efficient*—they provide effective sealing with a minimum of power loss and heat generation.

For positive bearing protection specify KLOZURE Oil Seals for your machinery. KLOZURES are made in many models and a complete range of sizes. Get all the facts—call your Garlock representative or write for KLOZURE Catalog No. 10.



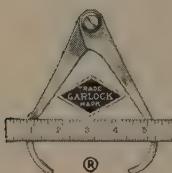
Model 53 finger spring KLOZURE, for normal and high speed service, applied to a shaft to protect the ball bearing.



Model 51—A general purpose finger spring seal for medium speeds.

Model 63—A general purpose finger spring seal for normal and high speed service.

Model 65—A general purpose finger spring seal for normal and high speed service.



THE GARLOCK PACKING COMPANY, PALMYRA, NEW YORK

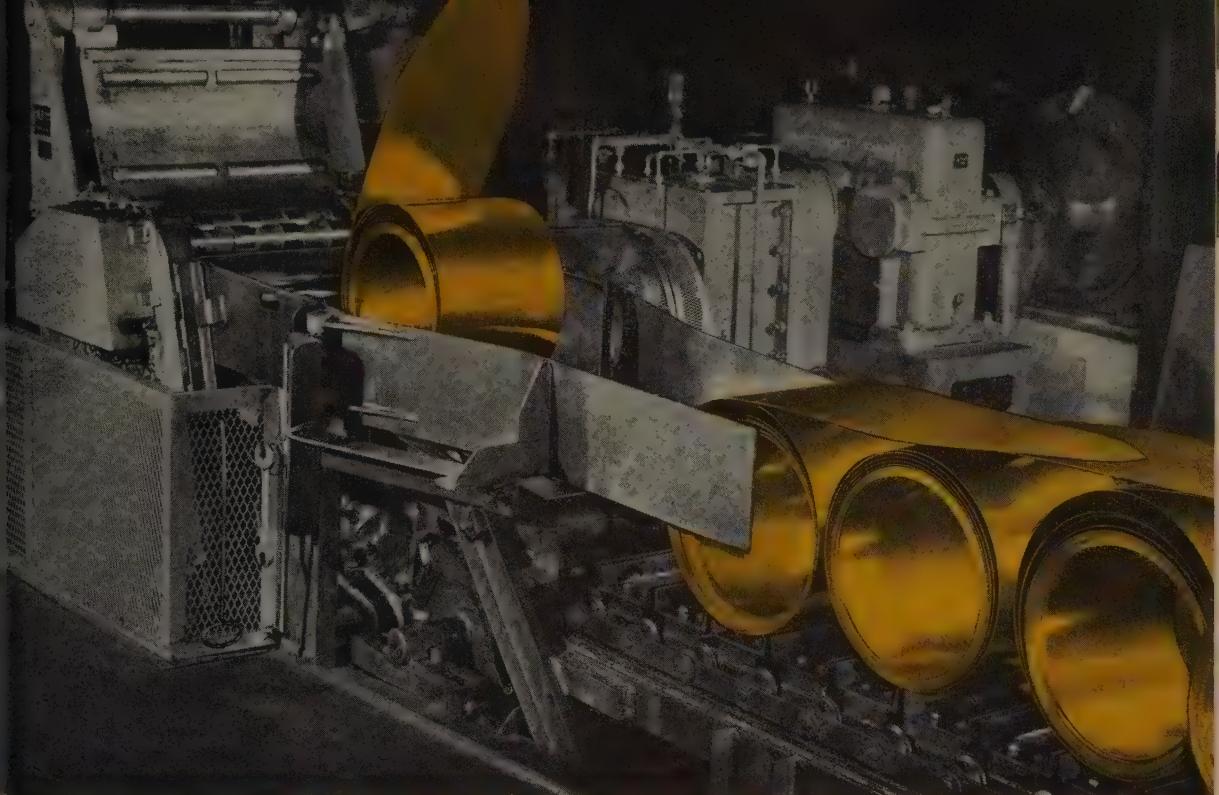
**Sales Offices and Warehouses:** Baltimore • Birmingham • Boston • Buffalo • Chicago • Cincinnati • Cleveland • Denver • Detroit • Houston • Los Angeles • New Orleans • New York City • Palmyra (N. Y.) • Philadelphia • Pittsburgh • Portland (Ore.) • Salt Lake City • San Francisco • St. Louis • Seattle • Spokane • Tulsa.

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# GARLOCK

PACKINGS, GASKETS, OIL SEALS,  
MECHANICAL SEALS,  
RUBBER EXPANSION JOINTS



## New BLISS coiler makes light work of heavy gage brass

*Enables American Brass Company to reduce costs and increase production on certain operations*

ever alert to reduce manufacturing handling costs, The American Brass Company installed a new Bliss coiler in their Waterbury, Connecticut plant. It replaced equipment which could not coil brass or nickel silver alloys heavier than 0.280" gage. This meant that long unwieldy bars—up to 30 feet—had to be carried back the sticking side of the mill in a costly transfer operation for additional passes to suit the coiler limitations.

With the new Bliss upcoiler, however, 0.400"-gage brass and silver alloys are coiled in widths up to 25

inches. Important savings in machine time and handling costs have been achieved.

The trend to heavier coilers can be observed throughout the metal-producing industry. For example, in addition to the installation at Waterbury, Bliss has supplied American Brass Company with three other duplicate design coilers for its Ansonia, Kenosha and New Toronto plants.

Modern coilers and other material-handling equipment are described and illustrated in Bliss' newly-revised 60-page brochure. Write today for your copy of Catalog 40-A.



**THREE-ROLL PYRAMID-TYPE UPCOILER**  
is of rugged, functional construction. Capacity: up to 0.4375" thickness and to widths of 28" on certain mild metals. Straight tailing feature is provided to produce flat "sticking ends" for subsequent passes.

number:

**BLISS**  
SINCE 1857

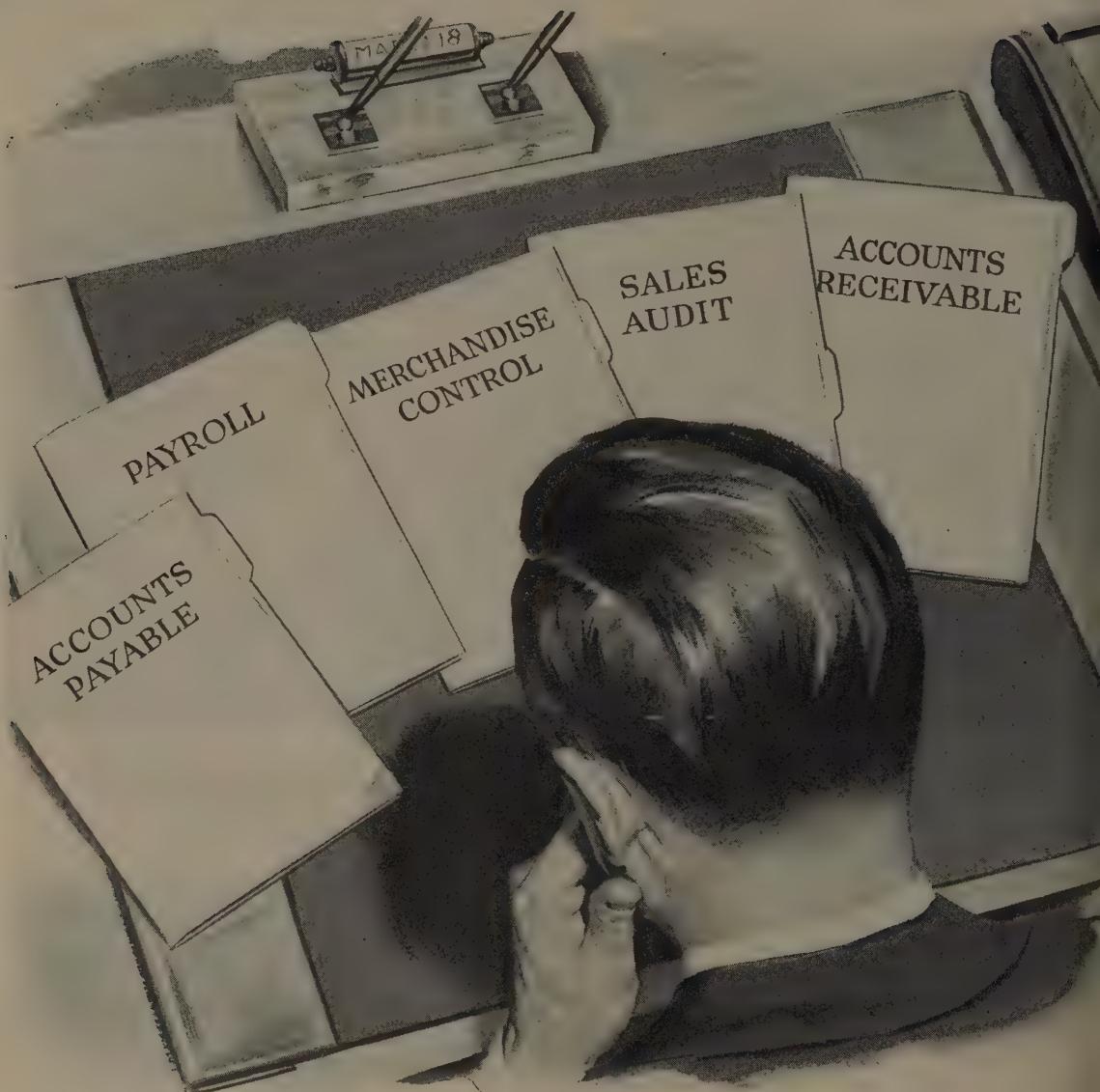
for Presses, ROLLING MILLS, Special Machinery

E. W. Bliss Company • General Office: Canton, Ohio

ROLLING MILL DIVISION: SALEM, OHIO

Subsidiary: The Die Supply Company, Cleveland, O. • E. W. Bliss (England) Ltd. • E. W. Bliss Company (Paris) France

J. S. Plants in Canton, Salem and Toledo, Ohio; Hastings, Michigan; and San Jose, Calif. Branch Offices in Chicago, Cleveland, Dayton, Detroit, Indianapolis, New Haven, New York, Philadelphia, Rochester, Toledo, and Toronto, Canada. West Coast Representatives: Moore Machinery Co., Los Angeles and San Francisco; Star Machinery Company, Seattle. Other representatives throughout the world.



## Can you cut expenses without cutting corners?

You can, but only by knowing continuously *where* your money is being spent and *why*. To keep giving you this kind of information before it becomes history takes a versatile accounting method backed up by versatile equipment.

In addition to all the *control* data you need, IBM accounting provides you with all the records necessary to each of the major areas of accounting. This means that your regular accounting data can be broken down in any way

to give you the best means of appraising various phases of your business. You get a complete business picture—showing where you can cut expenses wisely to increase current profits and keep your company in "fighting trim."

IBM accounting machines do the complete job—often providing important savings in time, overhead, and money. For details, call the local IBM office today.

**IBM**  
TRADE MARK

*International Business Machines, 590 Madison Avenue, New York 22, N.Y.*

Part: ..... Pilot Stud— $1\frac{5}{8} \times 6$ " long  
Material: ..... A-4615 CR Steel  
Machine time on Model M: ..... 7½ minutes  
Machine time by former method: ..... 17 minutes

**JOB FACTS:**

Part: ..... Whirl— $3\frac{1}{2} \times 4\frac{5}{8}$ " long  
Material: ..... Leaded Open Hearth Steel  
Machine time on Model M: ..... 5¾ minutes  
Machine time by former method: ..... 21 minutes

Here's why it takes

more than just speed

*to keep production on schedule*



It's one thing to be able to machine a steel part at the fastest practical speeds and feeds. But speed without dependable control is wasted. You get both speed and control with **MODEL M SINGLE SPINDLE AUTOMATICS**.

Take the parts shown. In both cases, the completed pieces are machined automatically at their same predetermined rate every time, without interruption. In the long stud there are 11 operations including threading—the piece is completed on the Model M in less than half the time of the former method. In the other piece (with a large hole partway and a small one the rest of the way) spindle speeds are changed automatically during the cycle to provide the best speeds and feeds for different diameter cuts—and the time for a finished piece is less than  $\frac{1}{3}$  that of the former method.

Why not get all the facts? Write for Catalog M-50A. Or, better still, ask our engineers to talk with yours about your production jobs—long or short run.

**Nothing can so completely destroy profits  
as the continued use of obsolete equipment.**

The **NATIONAL**  
**ACME COMPANY**

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ACME-GRIDLEY BAR  
and CHUCKING AUTOMATICS  
1-4-6 and 8 Spindle • Hydraulic  
Thread Rolling Machines • Auto-  
matic Threading Dies and Taps •  
Limit, Motor Starter and Control  
Station Switches • Solenoids •  
Contract Manufacturing.

For Intermittent Service  
You Can't Beat this Welder

You Can't Beat its Price

You Can't Beat  
its Performance



# New P&H TI-295 295-amp AC Welder

**... the only low-cost intermittent-type welder  
that can handle low-hydrogen and stainless-steel electrodes**

Here's a low-cost, low-input welder — with a rated load and duty cycle as follows: 295 amps, 20%; 250 amps, 30%; 200 amps, 50%.

**Wide Range** — You can go from 25 amps to 300 amps. You can use this machine on light-gauge material, as well as on heavy plate.

**No Arc Booster** — Just think — you get an open-circuit voltage of 75 volts. This means — you can weld with low-hydrogen or stainless-steel electrodes. No other welder that sells for the low price of the TI-295

can do this. Arc-striking is easier and electrode-sticking eliminated.

**Exclusive P&H Dial-lectric Control** — You get sound, uniform welds because all you have to do is turn a radio-like knob to get exactly the heat you need. The amperage adjustment is creep-proof too — you set the heat and it stays. Changing heat is only a matter of a second or two — a three-quarter turn of the knob is all that's required to go from minimum to maximum capacity.

No hard-to-work crank to turn. No moving parts — no moving

coils or cores, no worm gears or sprockets, chain or lever adjustments. This means there's less wear, less maintenance, *less noise* — nothing to bind or "freeze" from rust.

Contact your P&H representative or distributor — see how easily the new P&H TI-295 outperforms other welders in this class.

**P&H** WELDING DIVISION

**HARNISCHFEGER**  
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4411 W. National Ave., Milwaukee 46, Wis.

2599

*the P&H Line*

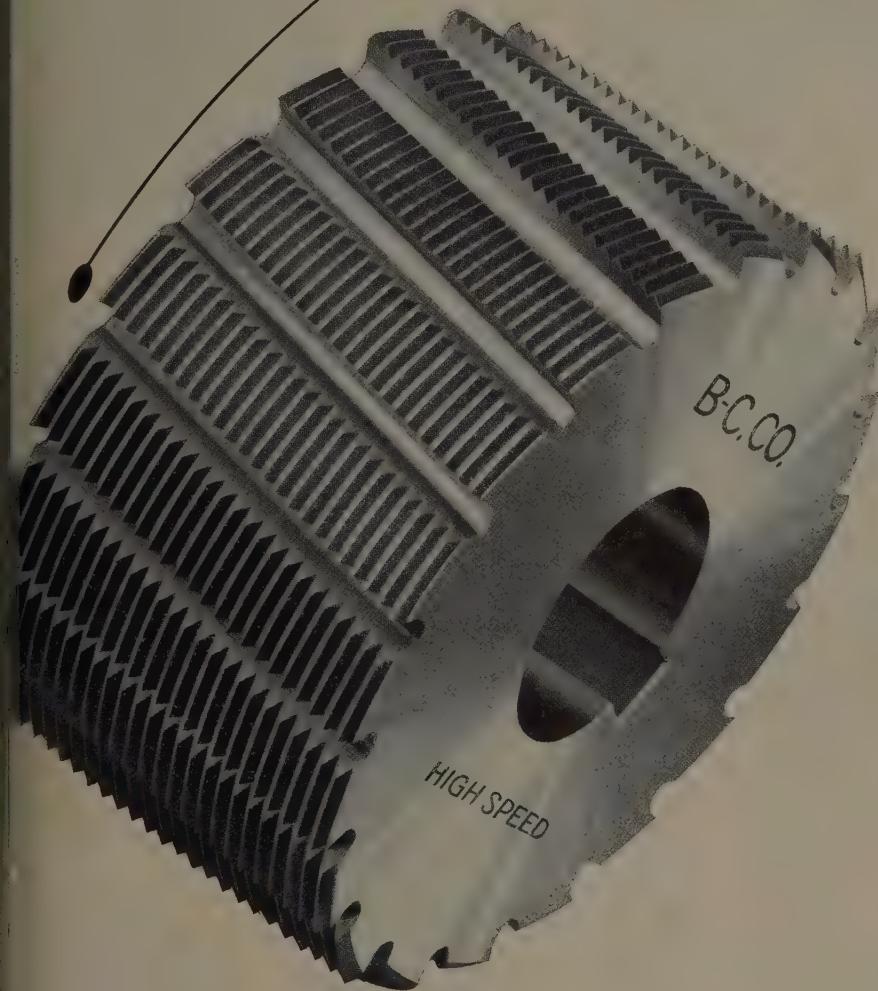


P&H Welding equipment is manufactured and sold in Canada by  
REGENT EQUIPMENT MANUFACTURING COMPANY LTD. • 455 King Street West • Toronto, Ontario, Canada

Barber-  
Colman

# THREAD MILLS

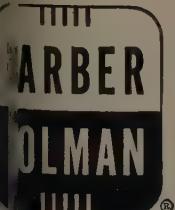
*custom-built  
for  
high  
production,  
long cutting  
life,  
accurate  
threads*



Thread accuracy and economical cutting life are synonymous with Barber-Colman Thread Mills because cutters which mill smoothly and easily, without premature dulling, also cut threads more accurately.

Barber-Colman cutter engineers have developed new manufacturing techniques for producing precision thread milling cutters with unground teeth, straight or helical flutes in either shell or shank styles, which give unusual tool life. The finest ground thread mills are also available from coarse to very fine pitches.

For special help in thread milling problems consult your Barber-Colman representative. He is a specialist on accuracy and milling of threads.



Barber-Colman Company

GENERAL OFFICES AND PLANT, 864 ROCK STREET, ROCKFORD, ILLINOIS

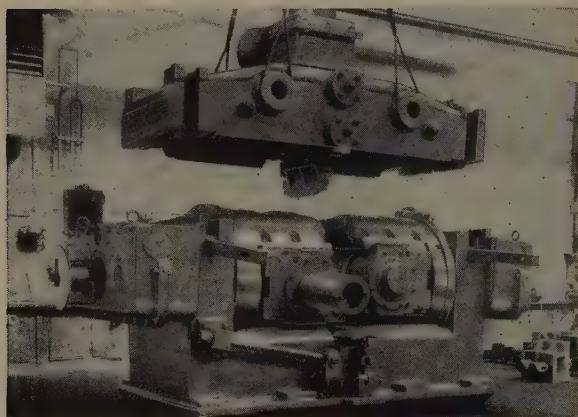
# New mill machinery speeds seamless tube production



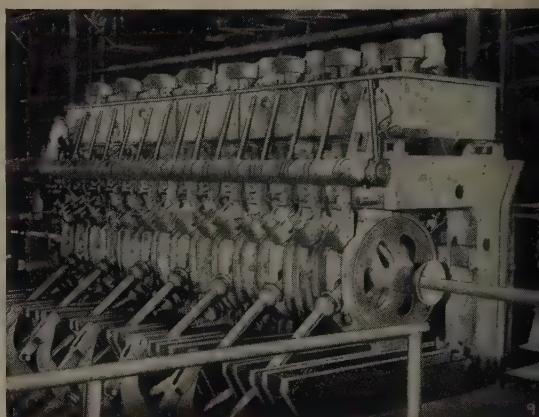
**HIGH OPERATING SPEED** of Mannesmann-Meer automatic return mill boosts production, cuts costs in any automatic mill plant. Special guides in mandrel bed aid quick changeover of schedules.



**180 STEEL TUBES PER HOUR** — that's the production record of mechanical extrusion press. We also offer high-speed hydraulic extrusion presses for the non-ferrous industries.



**HEAVY-DUTY REELER WITH ROLL OBLIQUITY** adjustable in both planes, has individual motor drive for each roll. Permits use of a plug of any taper for any desired expanding action. All Mannesmann-Meer reelers are extra heavy and rugged in construction with anti-friction bearings throughout to assure best possible rolling conditions.



**INCREASE OD REDUCTION** at each three-roll stand on this three-roll stand on this reducing mill. New low-cost group drive permits speed adjustment for each stand. Special stand changing device provides quick schedule change. These same features are available for continuous mandrel mills. Many outstanding design features are available for both sinking and sizing mills.

Got production bottlenecks on seamless tubes?

At Mannesmann-Meer you'll find complete mills or mill machinery designed and built specifically to speed production and cut costs.

We're the *only* manufacturer of tube mill machinery who can draw on over 65 years of experience in the *operation* as well as the design of complete seamless mills. Let us put this production and engineering know-how to work for you.

Examples of some of our new developments in mill machinery are shown here. Mechanical and hydraulic extrusion presses — piercing mills — automatic return (plug) mills — continuous mandrel mills — heavy-duty reelers — assel mills — pilger mills — expanding mills — sizing mills — stretch-reducing mills — large electric weld pipe mills — rotary straighteners — tube reducing machines — are but a few of the many products in our complete line.



**MANNESMANN-MEER**  
ENGINEERING & CONSTRUCTION COMPANY  
900 Line Street, Easton, Penna.

**WORLD SPECIALISTS IN HIGH-SPEED TUBE-MILL MACHINERY**

New facts for your file on

# USS CARILLOY STEELS

## USS Carilloy steel passes rigid tests for propeller blades

● An important manufacturer of propellers for military aircraft has found that in stringent magnaflux tests, USS CARILLOY steel performs completely satisfactorily.

The high stresses in propeller blades and hubs naturally require extremely high quality steels. Accordingly, the U.S. Army and U.S. Navy have set up rigid quality specifications requiring that every heavily stressed part must be magnafluxed several times during its production.

With USS CARILLOY 4340 electric furnace aircraft quality steel, this important manu-

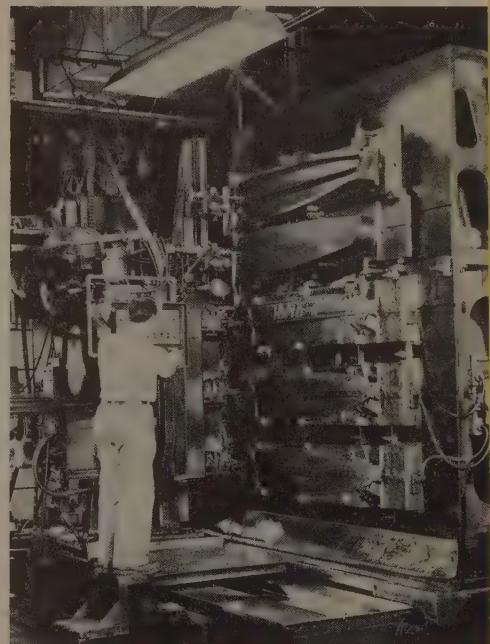
facturer is able to count on the performance required for this severe application. The consistent high quality of USS CARILLOY aircraft steel has meant greater savings to this customer through minimum magnaflux rejections of costly fabricated parts.

USS CARILLOY steels have established an enviable record for meeting the highest quality requirements. Therefore, when you need a standard AISI analysis or a special steel for an unusual application, it pays to call in a USS Service Metallurgist. He can help you solve any steel problem.



THESE HIGH QUALITY aircraft propeller hubs are forged and machined from semifinished CARILLOY 4340. They meet extremely tough magnaflux requirements.

FOR BIG PROPELLERS, 2 forged sections (a) are welded together to form one blade thrust member. Pieces are then ground and magnafluxed, Kellered, ground, and magnafluxed again (b). Mill camber sheets (c) then are copper brazed to the thrust members. Entire unit is heat treated and polished before final magnaflux test and cadmium plating. Rigorous magnaflux testing assures that every finished blade (d) can withstand the tremendous stresses encountered on the latest high-speed planes.



AFTER FORGING AND MILLING, 750-lb. thrust sections are hogged out on this Kellering machine. Finished sections weigh about 155 lbs. USS CARILLOY steel maintains a No. 1 quality position on these heavy-duty parts.



UNITED STATES STEEL CORPORATION, PITTSBURGH - COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO

TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. - UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST

UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

# New facts for your file on

## USS STAINLESS STEEL

SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTION

### Solids removed from potash brine in centrifugals of Stainless Steel



THIS STAINLESS STEEL centrifugal filter at International Minerals and Chemical Corporation, Carlsbad, N. M., handles 10 tons of 60% muriate crystals per hour. It was manufactured by Bird Machine Company, South Walpole, Mass.

• Processing potash from the salt beds near Carlsbad, N. M., puts centrifugal filters to a severe test. That's why much of this equipment is made of Stainless Steel.

The potash brine is highly corrosive and the solids to be recovered are very abrasive. As a result, Bird Machine Company, South Walpole, Mass.—which supplies many of the centrifugals for this type of application—uses Stainless Steel for rotating parts and other parts of the filters that come in contact with the material.

Filters built of Stainless have handled many thousands of tons of these materials—separating and dewatering the crystalline solids—with high efficiency and overall economy.

### Lake steamer cafeteria is fabricated from Stainless Steel

The attractive appearance, excellent sanitary qualities and long life of Stainless Steel have gained a wide range of food handling jobs for this durable material.

N. Wasserstrom and Sons, Incorporated, Columbus, Ohio, in fabricating cafeteria equipment for a Great Lakes steamer, used Stainless Steel very extensively. The result is an installation that looks well, cleans easily and lasts almost indefinitely.



STAINLESS STEEL was used extensively in this cafeteria installation for a lake steamer. The installation was fabricated by N. Wasserstrom and Sons, Incorporated, Columbus, Ohio.

### Now is the time to use the sales appeal of Stainless Steel

The many benefits of Stainless Steel make its use in your product a real "plus" from a sales standpoint. Its lasting good looks alone will often justify its use. And, along with this important advantage, goes exceptional resistance to corrosion and

abrasion, ease of cleaning and low maintenance costs.

There's never been a better time to take advantage of the qualities of Stainless Steel. And when you do, be sure that perfected, service-tested USS Stainless Steel is used.



UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO  
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UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL



1953

# USS HIGH STRENGTH STEELS

## USS COR-TEN steel gives heavy-duty earth moving equipment the stamina to stay on the job

By building maximum strength and durability into parts ordinarily prone to failure, Allis-Chalmers, through the use of USS COR-TEN steel, has ensured a high degree of productivity and profitable performance for their TW-300 Motor Wagon.

Used in the sides, ends and bottoms of the bowl of this big capacity hydraulically operated bottom dump wagon, COR-TEN steel increases strength 50% over carbon steel construction, provides 50% higher fatigue strength, materially increases resistance to abrasion and to sudden blows in loading. An added advantage is increased resistance to atmospheric corrosion—4 to 6 times that of carbon steel.

As a result, breakdowns and time-out for repairs are reduced to a minimum, as are maintenance and replacement costs.



### mass-produced truck body members, SS COR-TEN steel saves weight, adds strength, facilitates accurate construction

mass-producing standardized truck body shapes and sections that can be easily and quickly assembled, Parish Steel Company, Reading, Pa., has made it possible for local body builders to turn out steel truck bodies to meet individual truck owners' requirements at high speeds and low cost. The use of USS COR-TEN high strength steel in these prefabricated

body sections not only permits light, strong and very durable construction, but because of the high physical properties of this steel and its consistent uniformity, it is possible to hold designs to exact limits and very close tolerances. Over-all results are much better than when less efficient materials are used.

With USS COR-TEN steel construction like this, the body builder benefits because his operations are speeded up and his assembly costs are reduced. The truck owner benefits because he gets a truck that, while light in weight, has maximum strength and durability, is readily repaired if damaged and requires minimum maintenance.



### New catalog gives complete story of USS COR-TEN steel

Here are 58 pages of factual data that show the substantial economies that can be affected in equipment and structures by using USS COR-TEN steel to reduce weight or to increase durability and service life. This book is just off the press. Crammed with information, it should be in the reference files of every designer. It fully describes the properties and characteristics of USS COR-TEN steel. Its many illustrations show the wide variety of applications in which this superior high-strength steel has been used to reduce operating costs and to keep maintenance costs at a minimum. Send for your copy.

UNITED STATES STEEL CORPORATION, PITTSBURGH  
TUBE DIVISION, PITTSBURGH

AMERICAN STEEL & WIRE DIVISION, CLEVELAND

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO

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NITRO STATES-STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL



# Borg-Warner speeds staking job 36%

with a 75-ton

## MULTIPRESS®

*Safer operation, fewer rejects and other production gains reported at Mechanics Universal Joint Division, Rockford, Illinois*

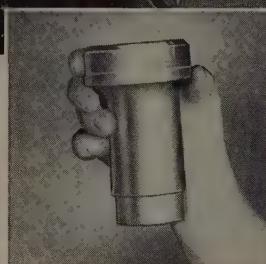
IN this operation, a flat steel disc 3/32" thick is inserted by hand in a steel sleeve used in an automotive universal joint. The disc rests on a shoulder formed where the inside diameter of the sleeve changes abruptly to a smaller dimension.

The sleeve is internally machined, leaving a small, continuous lip of metal just above the edges of the correctly seated disc. With gentle, smooth staking effort, the Multipress ram tooling forces this lip solidly against the edges of the disc. It is a precision operation, as the disc must separate the two different I.D. areas with a permanent oil-tight seal.

The 75-ton Multipress, equipped with a six-station Denison Index Table, is set for continuous cycling. The ram reverses automatically when preset pressure is reached.

The operator simply places the parts in the table fixtures, with the discs properly in place. The parts are then indexed automatically under the ram, and the oil seal is firmly staked in place. At the second index position past the ram, the operator removes the staked assemblies.

In addition to a 36 per cent production gain, Multipress does the job with closer uniformity. Scrap has been reduced to the vanishing point, die life increased, and labor costs cut. The same Multipress brings similar savings on 21 different operations at this plant.



In the thick-walled steel sleeve both outside and inside diameters are larger at one end. A disc-shaped oil seal separates the different-sized areas.



The sleeves, with oil-seal discs in place, are simply placed in fixtures at each of six Index Table stations, permitting continuous loading and unloading.

Multipress offers a wide range of bench and floor models, in capacities from one-ton to 75 tons. Manual, footpedal, push-button or automatic controls are available, for single or sequence operations. Dual safety controls and the servo-type Multipress Touch Control are also available. Six-station and 12-station Indexing Tables and many other standard Multipress attachments provide many additional production-speeding advantages. Write for the illustrated story "MULTIPRESS — and how YOU can use it" . . . there's no obligation.

**DENISON**  
Hydro OILICS

PUMPS

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PRESSES



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## ... are **SAFE** Wheels

Constantly higher grinding wheel safety factors have developed from BAY STATE'S 32 years of grinding wheel progress.

Pioneers in the field of scientific grinding wheel reinforcement, BAY STATE research found the secrets of adding functional strength to the natural sharpness of abrasive products.

To rigid wheels, for example, BAY STATE adds the tensile strength of steel, imbedded or tension-wound as safety demands. To wheels that must flex and "give" to do their work, BAY STATE builds in the resilient ruggedness of carefully selected sinewy fibers.

Results: Efficient SAFE wheels for *all* your grinding operations from BAY STATE . . . a foremost supplier of abrasive products to American industry.



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Branch Offices and Warehouses — Chicago, Cleveland, Detroit, Pittsburgh

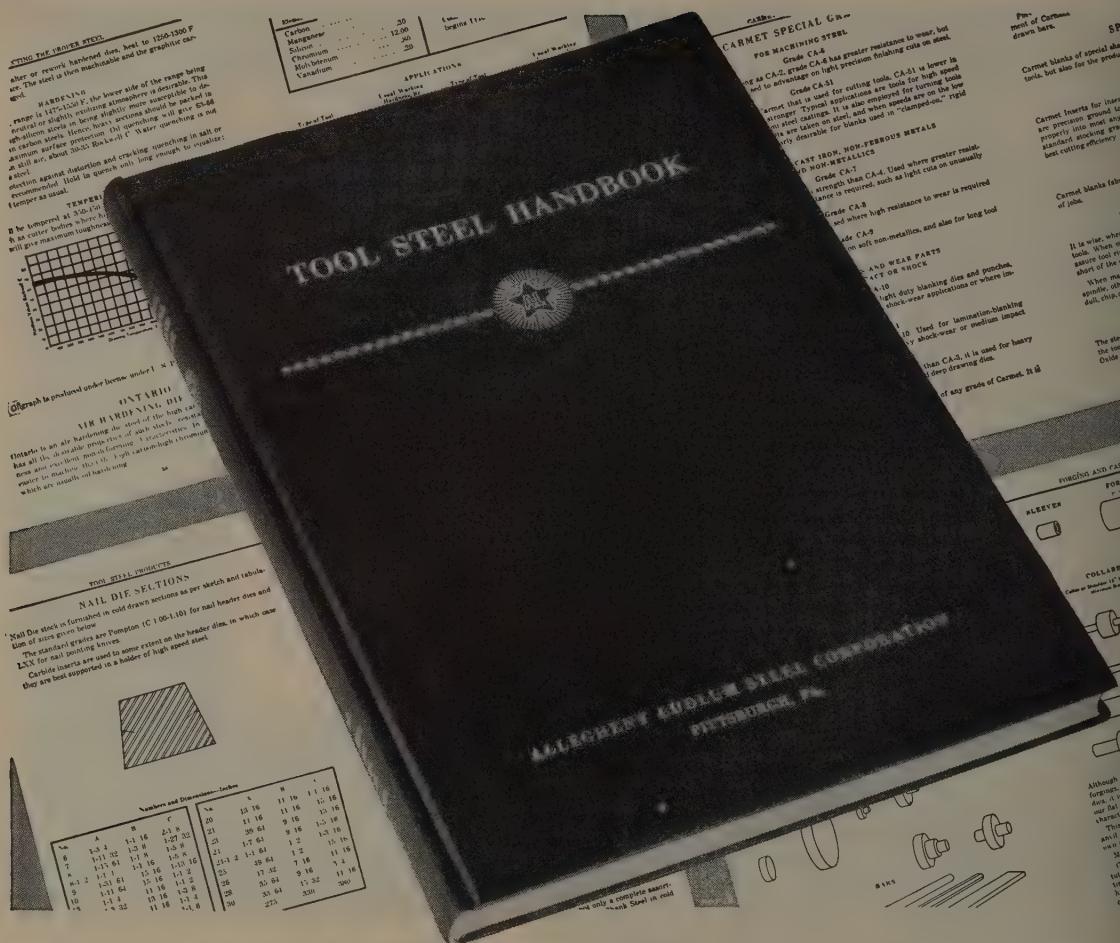
Distributors — All principal cities

In Canada: Bay State Abrasive Products Co. (Canada) Ltd., Brantford, Ont.



Safety Literature available  
on all phases of grinding.

*Manufacturers of all types of Quality Abrasive Products*



# **AVAILABLE NOW - 196 pages of Valuable Tool Steel Information**

Another printing of our Tool Steel Handbook—one of the most comprehensive treatises of its kind ever offered by a tool steel producer—is just off the presses. In addition to a relatively complete picture of Allegheny Ludlum Tool Steels, their properties, applications and the forms in which they are available, this 196-page case-bound book presents an extensive discussion of heat treating and handling techniques

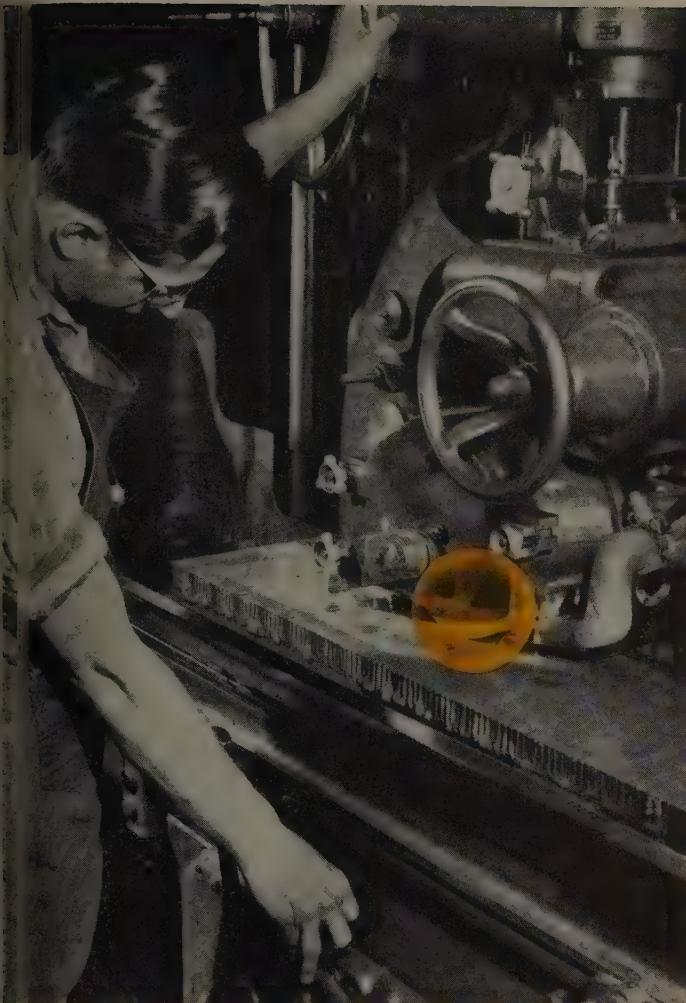
as well as a complete set of weight tables and other useful reference material.

Your copy of the Tool Steel Handbook will be sent—*without charge*—upon request. Our only stipulation: please make your request upon your company letterhead. • Write to *Allegheny Ludlum Steel Corporation, Oliver Bldg., Pittsburgh 22, Pennsylvania.*

ADDRESS DEPT. S-52

For complete MODERN Tooling, call  
**Allegheny Ludlum**





"...new G Bond ALUNDUM\* wheels give us double the production of former standard wheels." That's how a Massachusetts manufacturer sums up the performance of the new Norton wheels in grinding hardened high-speed steel textile blocks. He adds: "Wheels used on this job must be very free and cool cutting to avoid warping and burning the very thin stock."



"...et a fast cut and good finish. They're the best and most versatile segments I ever used for this kind of work and I'm re-ordering ten sets," reports an Illinois customer using G Bond segments for surface grinding mild steel, cast iron and Meehanite — all three.

*These users say:*

## For surface grinding, the new **G BOND** beats them all!

*Latest Norton wheels bring  
you the money-saving  
**"TOUCH of GOLD"***

Naturally, we've kept close watch on how the new G Bond wheels are doing. And we can report that throughout the range of precision and semi-precision grinding applications they're already away out in front. In the field of surface grinding, for instance, a composite statement by users of the new G Bond would run very much like this:

*"G Bond wheels cut freer, cooler, faster — enabling us to take heavier cuts in costly high speed steels without drawing temper. They give us closer tolerances and smoother finishes. They dress easier and produce more pieces per dressing. Doing more work and a greater variety of work — per wheel, they outlast any wheels we ever used before."*

### **G Bond Wheels for YOUR Surface Grinding**

will bring new speed and economy to surface grinding jobs — thanks to their unique grain-holding structure that produces greatly improved cutting action. Remember, the G Bond is the most modern, most efficient vitrified bond ever developed — a typical Norton "Touch of Gold" achievement that steps up grinding performance and product quality while cutting grinding costs.

### **See Your Norton Distributor**

for the ALUNDUM G Bond wheels, cylinders and segments you need. Or write to NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities, listed under "Grinding Wheels" in your classified phone directory. Export: Norton Behr-Manning Overseas Inc., Worcester 6, Mass.

W-1537

\*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

**NORTON**  
BRASIVES

Making better products... to make other products better

*At the NATIONAL SUPPLY COMPANY,  
Torrance, California*

**Flame hardening with GAS  
reduces highly specialize  
tooling**



*Flame hardening of a gear for a  
drilling rig rotary is accomplished  
at National Supply Company by  
means of a semi-automatic setup.  
The heated tooth is moved by an  
indexer to a water spray for  
quenching.*

TO REDUCE THE NUMBER of highly specialized and costly tooling in a production of oil well drilling machinery, plant engineers of the National Supply Company have devised new methods of flame hardening which utilizes natural gas.

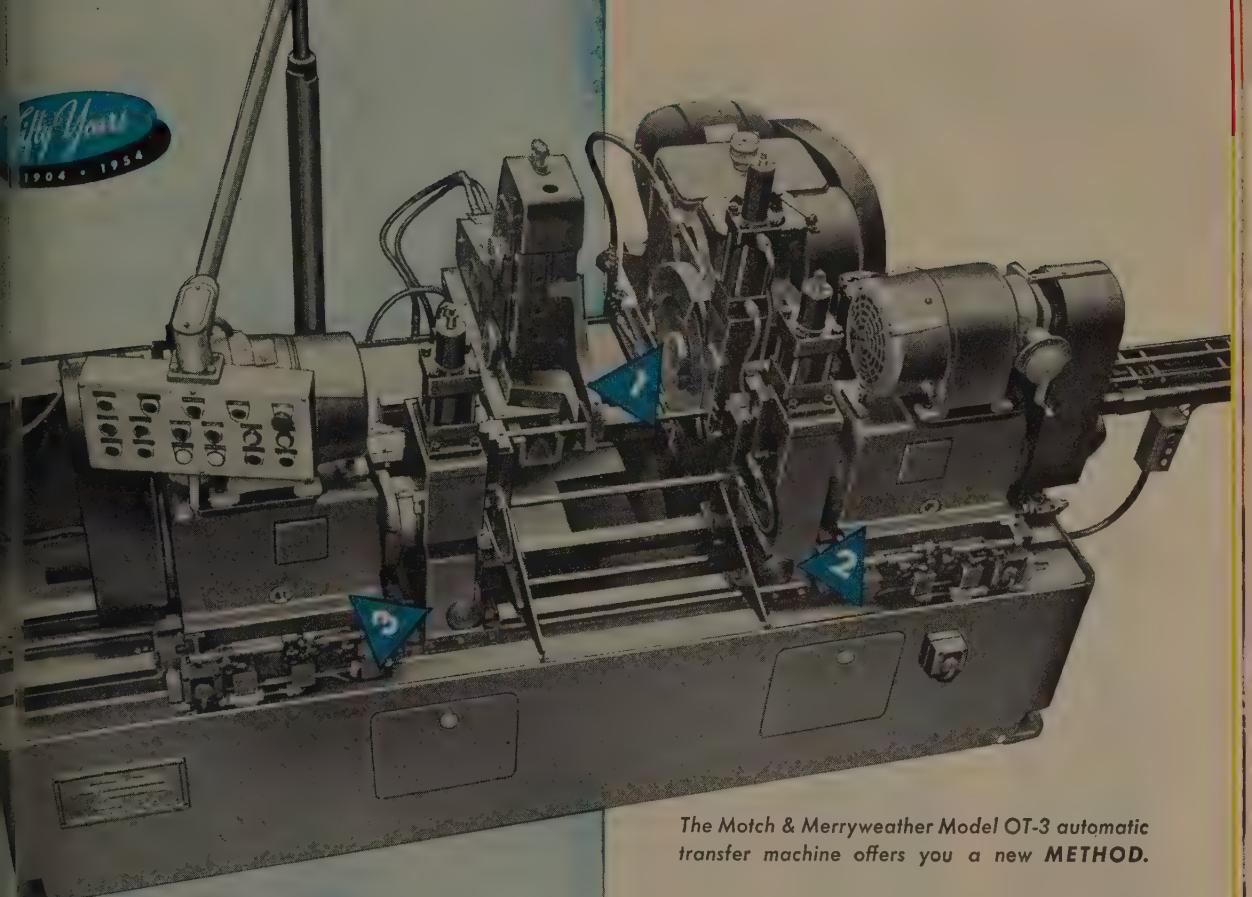
Using these methods, the flexibility of Gas permits the adaptation of a comparatively small number of versatile machines and burners to flame harden many different parts. The large variety of shapes and sizes and the relatively small number of parts of each type make the highly specialized tooling prohibitive in cost. To overcome this obstacle, Gas is mixed with oxygen in order to

attain high enough temperatures to heat the surface of steel parts above the transformation temperature. Then, water or oil rapidly quenches the heated part to room temperature. This produces a continuous hard surface of uniform depth that will resist wear by abrasion over a softer, more shock resisting core.

This is but one example of the many ways in which Gas and Modern Industrial Gas Equipment are being utilized throughout the production lines of industry. For more information on how Gas is being used to increase the efficiency of heat treating production lines, contact your Gas Company Representative or Gas Equipment Dealer.

**AMERICAN GAS ASSOCIATION • 420 Lexington Avenue, New York 17, New York**

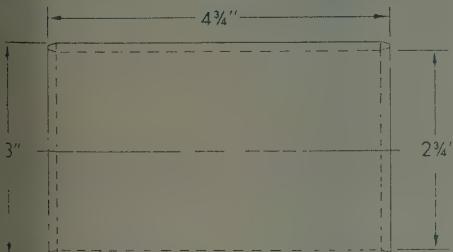




The Motch & Merryweather Model OT-3 automatic transfer machine offers you a new **METHOD**.

Buy Profits - PUT

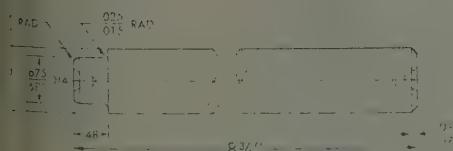
**3 HEADS TO WORK  
SIMULTANEOUSLY!**



**OPERATION:** Cut off, chamfer inside and outside, and face.

**MATERIAL:** SAE 1020 steel tubing.

**PRODUCTION:** 140 pieces per hour.



**OPERATION:** Cut off, turn radius, chamfer and center drill one end; chamfer and center drill opposite end.

**MATERIAL:** SAE 1020.

**PRODUCTION:** 288 pieces per hour.



Cut off to square, accurate, milled-finish lengths and double-end machine your work continuously, and simultaneously. Bore, face, chamfer, center drill, turn, ream, or groove singly or in combination. Cut-off time is virtually free. Save labor; save tooling, time, overhead, floor space.

**THE  
MOTCH & MERRYWEATHER  
MACHINERY CO.**

CLEVELAND 13, OHIO

# See

**America's Most Complete Line  
of Industrial Small Tools**

**BROWN & SHARPE**

AMERICA'S ONLY MICROMETERS  
with STAINLESS STEEL SPINDLE AND SCREW

LONG WEARING  
CARBIDE MEASURING FACES

**Machinists' Tools and Gages:**  
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**Adapters  
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Permanent Magnet Chucks  
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**VISIT OUR EXHIBIT  
BOOTH 1402  
A.S.T.E. EXPOSITION  
Apr. 26-30 at Philadelphia**



**featuring...**

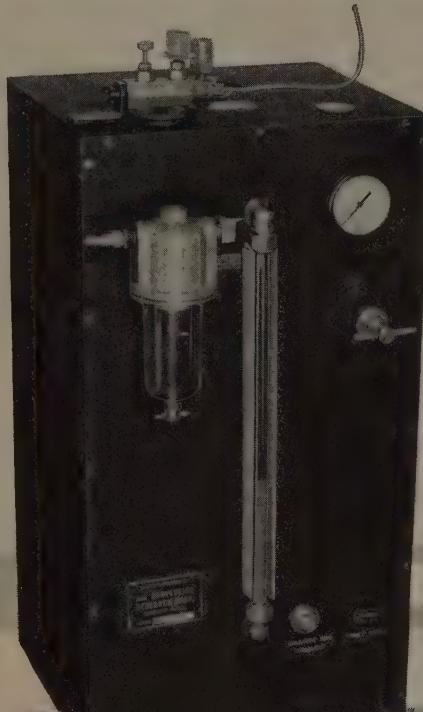
precision products that make possible  
the most efficient and economical  
production of accurate work

# **Brown & Sharpe**



# LO-JET ACRO

Now!  
the new  
improved  
mist cooling  
system!



the revolutionary new coolant system that keeps cutting tools and work at below room temperatures... prolongs tool life, cuts tool breakage loss... saves money...speeds production...keeps work clean...protects operators and is fireproof!



re efficient and adaptable—with separately controlled multiple spray heads. One nozzle can produce a true fog spray while other gives a liquid stream.

ier to regulate—master panel control makes every adjustment simpler, much more accurate. Spraymix control, attached by flexible tubes to top of unit, makes for easy positioning and precise, constant spray control.

re compact—all controls, regulators, valves are in one place, at the operator's fingertips.

arter looking—a single neat, green wrinkle-finish case houses all mechanisms and controls. The new design eliminates excess piping.

stable or stationary—mounting permits hand-the-plant portability, and sturdy bracket mounting also provides for permanent one-location use. Both mountings come with unit.

# LO-JET ACRO

SEE THE NEW LO-JET AT THE A.S.T.E. SHOW—DEMONSTRATIONS AT BOOTH 1251

there's a Lo-Jet Acro system for every purpose, every machine—write now for details!

**AIR CONVERSION  
RESEARCH CORPORATION**

4107 NORTH DAMEN AVENUE  
CHICAGO 18, ILLINOIS

Air Conversion Research Corporation  
4107 N. Damen Avenue, Chicago 18, Ill.

S-4

Gentlemen: Please send me full information about the new Lo-Jet Acro mist cooling system.

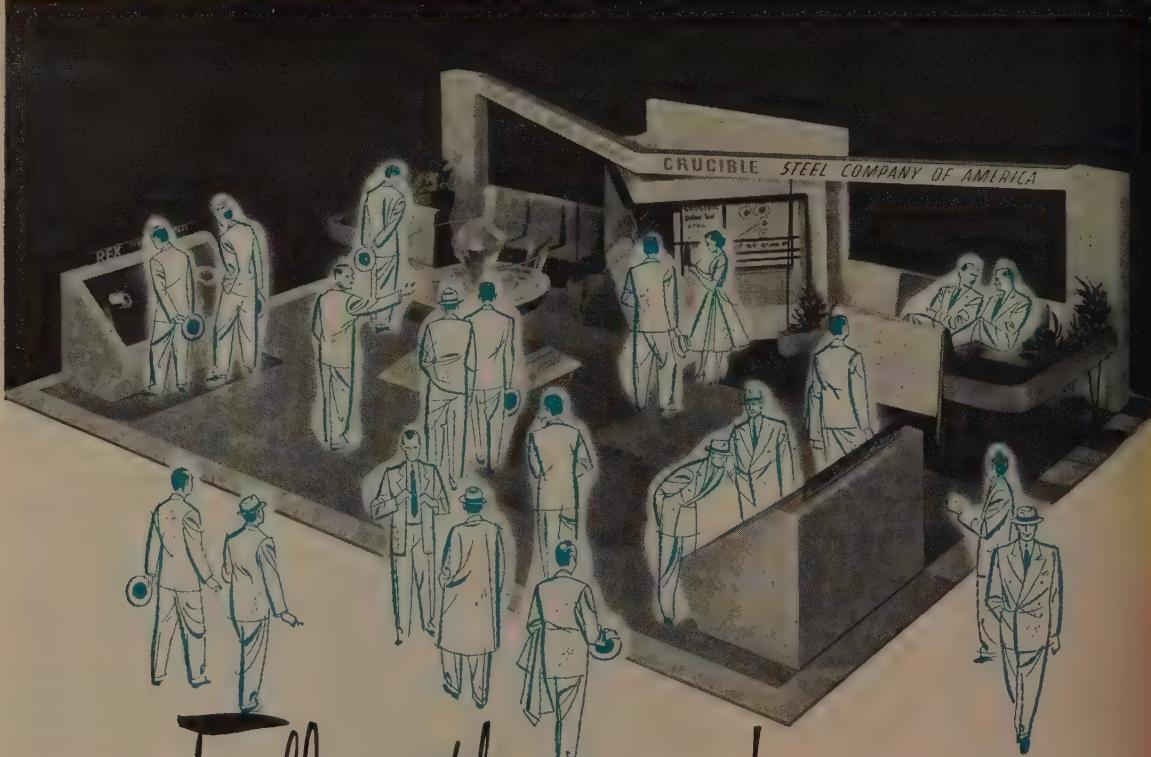
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firm \_\_\_\_\_

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city and zone \_\_\_\_\_

state \_\_\_\_\_



Follow the crowd

TO THE BIG CRUCIBLE EXHIBIT AT

THE ASTE SHOW...

**BOOTH 626**

American Society of  
Tool Engineers Show  
Convention Center, Philadelphia, Pa.

April 26-30

There are always worth-while things to see at the Crucible exhibit... and there'll be even more in the way of helpful material this year. Among other items, you'll find new exhibits and information on Rex high speed steels, tool steels—including hollow tool steel bars—and other special purpose steels.

You'll find, too, a group of experienced Sales Engineers and technical people who can help you with your application problems. So be sure and follow the crowd to the Crucible booth. We'll look for you.



**CRUCIBLE**

first name in special purpose steels

54 years of **Fine** steelmaking

**TOOL STEELS**

CRUCIBLE STEEL COMPANY OF AMERICA • TOOL STEEL SALES • SYRACUSE, N.Y.

10%

# ARROW-HART



## Electronic **VARIABLE SPEED DRIVE**



One  
Machine  
does all this  
The "BRAIN" that brings "AUTOMATION" to this new

- HANDLES ALL TYPES OF WOOD, SHEET METAL and MACHINE SCREWS
- SLOTS ALL HEAD SHAPES in ALL MATERIALS
- HANDLES ALL SCREW BLANKS from NO. 2 to NO. 12 and from  $\frac{1}{4}$ " to  $1\frac{1}{2}$ " LONG
- ADJUSTS FROM 125 TO 720 PIECES PER MINUTE

BOTH THE WORK CARRIER WHEEL AND THE SAW HAVE FOUR SEPARATE SPEEDS THAT CAN BE INSTANTLY ADJUSTED INDEPENDENTLY OF EACH OTHER

## **ROY SCREW SLOTTER**

THANKS TO ARROW-HART VARIABLE SPEED DRIVE!

TURN THE PAGE FOR ADDITIONAL INFORMATION

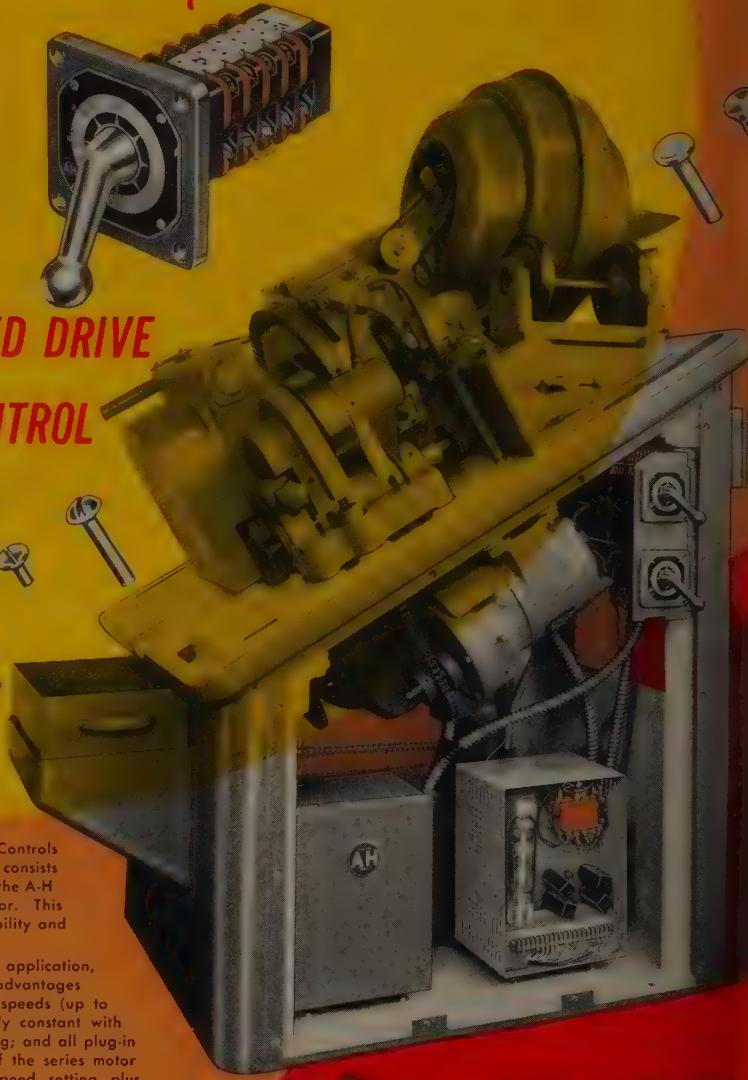
# Here's another important step in Machine Tool "AUTOMATION"

MADE POSSIBLE BY THE



## Electronic PACKAGED DRIVE WITH "PPS" SWITCH CONTROL

Thanks to Arrow-Hart Controls, this new screw slotter has achieved a degree of automaticity and adaptability that far surpasses that of any previous machine of this type. It is equipment like this that will be the basis of tomorrow's "automatic factories."



The two Arrow-Hart Electronic Variable Speed Controls used in the slotter are Packaged Drives; each consists of: an operator's station (the A-H "PPS" Switch), the A-H Variable Control Unit, and the series motor. This Package provides an unparalleled control, flexibility and versatility at low cost.

For any fractional horsepower variable speed application, an Arrow-Hart Drive offers many important advantages including: low cost; a wide, stepless range of speeds (up to 100 to 1 if required); speeds held substantially constant with varying loads; dynamic braking; instant reversing; and all plug-in replaceable parts for easy maintenance. Use of the series motor provides higher breakaway torque at any speed setting plus faster acceleration.

Especially where multiple operations or settings are required, the "PPS" Switch adds greatly to economy, versatility and efficiency. Acting in place of push buttons, relays and contactors, it provides safer, more convenient single point control. The operator can move from any position on the dial to any other position without activating any of the intervening circuits. Up to 16 positions are available from one compact control station.

### Send Now FOR COMPLETE Control INFORMATION



This high output screw slotter handles a wide variety of screw sizes, types and materials. Operation, including deburring, is completely automated. Screw blanks are simply placed in the hopper on top. Finished work is discharged into the work basket or the tray. The machine is manufactured by the Grozite Manufacturing Company, Inc., Hartford, Conn., and sold exclusively by Ray Machine and Sales, Inc., also of Hartford.



Industrial Control Division

THE ARROW-HART & HEGEMAN ELECTRIC COMPANY  
103 Hawthorn Street, Hartford 6, Conn.

Please send me complete information about the Arrow-Hart

Electronic Packaged Drive    "PPS" Switch    "RA" Motor Controls  
 Push Button Controls    Air Conditioning Controls

NAME \_\_\_\_\_

CO. NAME \_\_\_\_\_

POSITION \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

ZONE \_\_\_\_\_ STATE \_\_\_\_\_

# ARROW-HART

INDUSTRIAL CONTROL DIVISION  
THE ARROW-HART & HEGEMAN ELECTRIC COMPANY

HARTFORD 6, CONN., U.S.A.

Offices, Sales Engineers and Warehouses in Atlanta, Boston, Buffalo, Charlotte, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Houston, Indianapolis, Kansas City, Mo., Los Angeles, Milwaukee, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, San Francisco. Service Sales Engineers in Columbus, O., Fayetteville, New York, Manchester, Ct., Seattle, Springfield, Mass., York, Pa.  
Canada: Arrow-Hart & Hegeman (Canada) Ltd., Mt. Dennis, Toronto

# HOW MAJOR INDUSTRIES NOW CUT

## Product Costs



**HOLLOW TRACTOR BOOMS**—Cold bending 12 ga. welded steel tapered tubes without distortion on Size 4 Pines unit eliminates expensive blanking and forming dies, saves tons of material for farm equipment manufacturer.



**EXTRUDED WINDOW FRAMES**—Part of production line setup in large aluminum fabricating plant, this small Pines Semi-Automatic saves space, accurately bends automobile window frame moldings.

**REFRIGERATION AIR CONDITIONING ELLS**—Special Pines Automatic Cut-Off Benders now produce copper ells and return bends at speeds up to 1500 per hour, reduce scrap losses to 1%.



**1 AIRCRAFT TUBING**—Smooth, extra sharp bends now produced in ultra-thin stainless steel tubing, saves space and \$14,000 per plane for aircraft manufacturer. Shown above, Pines Size 4 Unit forming wrinkle-free 8" c/l radius bend in 4" x .020" S. S. tubing.

## with PINES PRODUCTION BENDERS

The examples shown here are a few of the countless number of production jobs that are now handled efficiently and more profitably on Pines Automatic Benders. They illustrate the versatility and the many cost-cutting advantages of cold forming round, square, rectangular, extruded, or hollow stock the "Pines-Way". Simplicity of tooling, uniform accuracy, and ease of operation are proven features of Pines machines which today help hundreds of plants cut product costs. At Pines you'll find an unmatched wealth of bending experience and creative tooling skill readily available to help you develop better methods and save time on production problems.

Write for  
Free data sheets

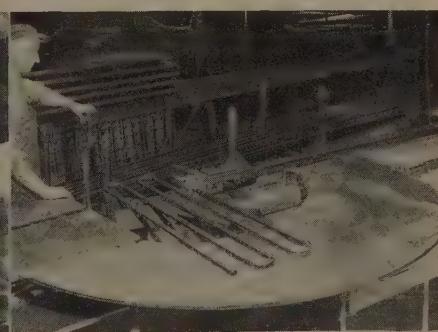
To keep abreast with latest developments in bending, write for copies of "Pines News" —bi-monthly mailing piece that gives facts on new, cost-cutting bending applications.

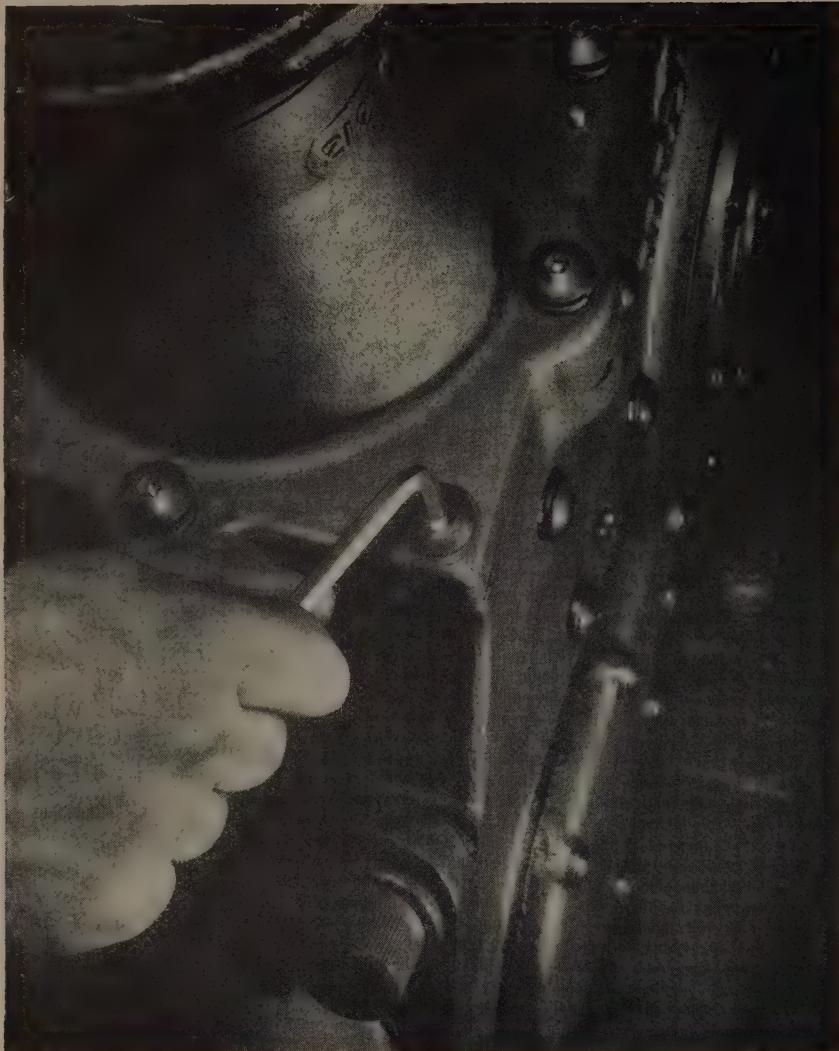


**PINES** ENGINEERING CO., INC.  
Specialists in Tube Fabricating Machinery  
662 WALNUT • AURORA, ILLINOIS

**5 ENGINE MANIFOLD TUBES**—Short 1 1/2" O. D. steel tube now bent to 1 1/2" c/l radius with flange attached saves space, insures accuracy, cuts costs.

**6 BOILER TUBE AND REFRIGERATION COILS**—Typical setup bending continuous serpentine coils from 3/4" steel tubing. Reduces welding, fabricating costs. Other installations range from 1/4" copper up to 3" steel tube.





**UNBRAKO** button head socket screws are used exclusively to assemble this controlled volume pump, which was designed to fill the growing industrial need for the pumping of an allotted quantity of liquid at higher pressures, higher capacities.

## Save inventory dollars Use **UNBRAKO** Standards—stocked by your distributor

Not only does your **UNBRAKO** distributor lower inventory investment, he also saves you time—and provides latest information about products, cost-saving methods, production techniques, current problems, trade practices. For latest data on **UNBRAKO** standard socket screw products, consult him or write **STANDARD PRESSED STEEL COMPANY**, Jenkintown 33, Pennsylvania.

*See us at Booth 1539, Convention Hall, Philadelphia, Pa., during the A.S.T.E. Show, April 26 to 30.*



SOCKET SCREW DIVISION

**SPS**  
JENKINTOWN PENNSYLVANIA



STEEL



The assembler inserts the **UNBRAKO** button head socket screw with his fingers, and runs it down as far as he can.



He then tightens it with a standard **UNBRAKO** key. Once seated, the low head design of the **UNBRAKO** button head provides a smooth, streamlined appearance.

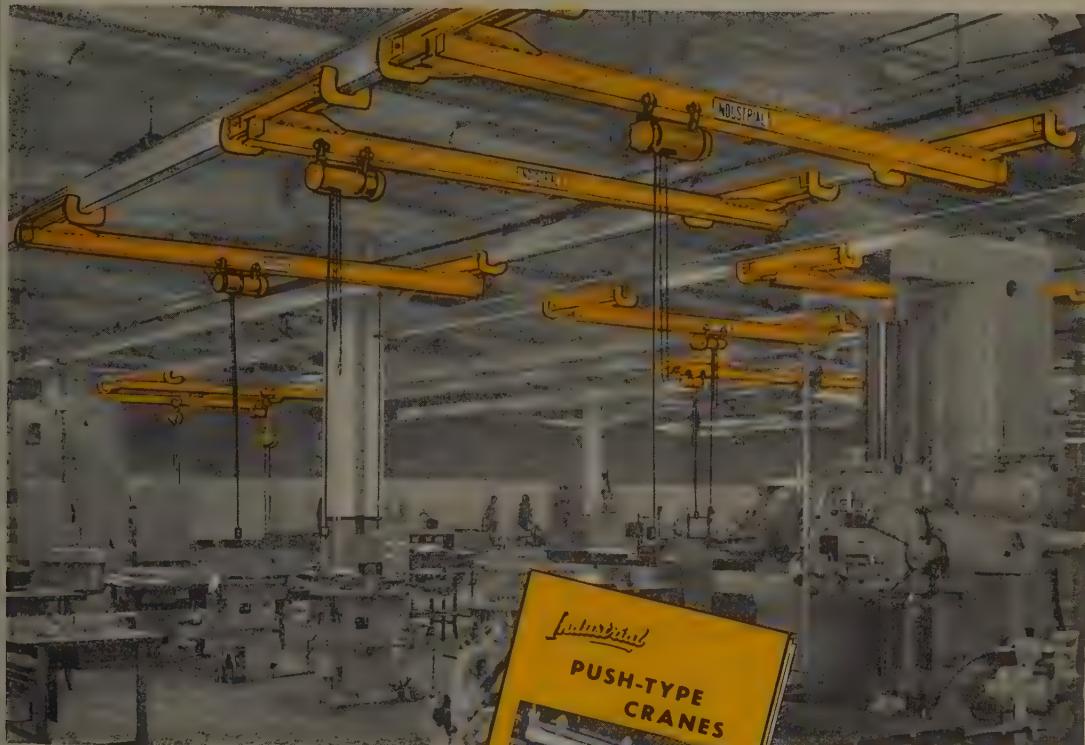


**UNBRAKO** Button Head Sock  
Screws are made of heat  
treated alloy steel; have  
fully formed threads, Cl  
3 fit; are available in  
standard sizes from #8-  
5/8". Accurate hex socket  
provides nonslip drive, pre-  
vents marring or mutilation  
of the head.

# Industrial

# PUSH-TYPE CRANES

SOLVE MANY MATERIALS HANDLING PROBLEMS

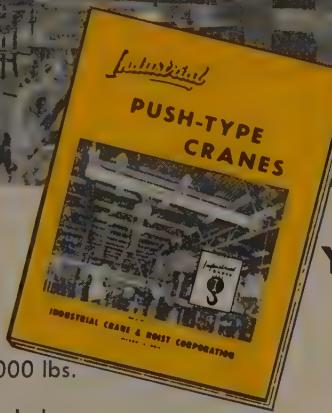


The Overhead Cranes shown in the above photo are a part of the 250 Industrial Push-Type Cranes installed in this modern plant.

Industrial Push-Type Cranes are available in 3 types—a light duty model in capacities to 4000 lbs.—and two heavy duty models in capacities to 8000 lbs.

Economical, rugged and dependable, Industrial heavy duty Push-Type Cranes are equipped with precision made end trucks for smoothest performance. Designed to function well with either hand operated or electric hoists.

Thousands in use throughout industry.



**SEND FOR  
YOUR COPY OF  
INDUSTRIAL  
PUSH-TYPE  
CRANES**

INDUSTRIAL CRANE & HOIST CORPORATION  
303 NORTH ADA STREET  
CHICAGO 7, ILL.

Send copy of Push-Type Crane Bulletin No. PT-1253.

NAME \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY, STATE \_\_\_\_\_

## INDUSTRIAL CRANE & HOIST CORPORATION

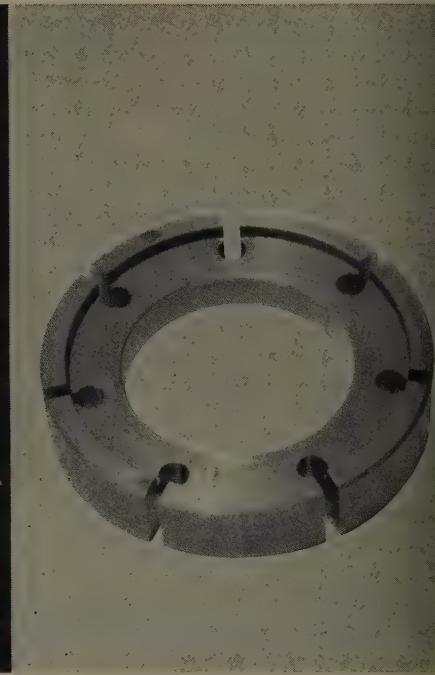
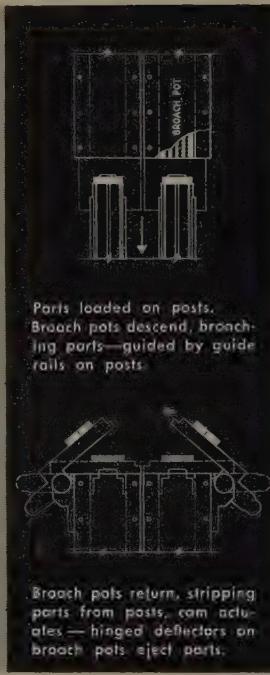
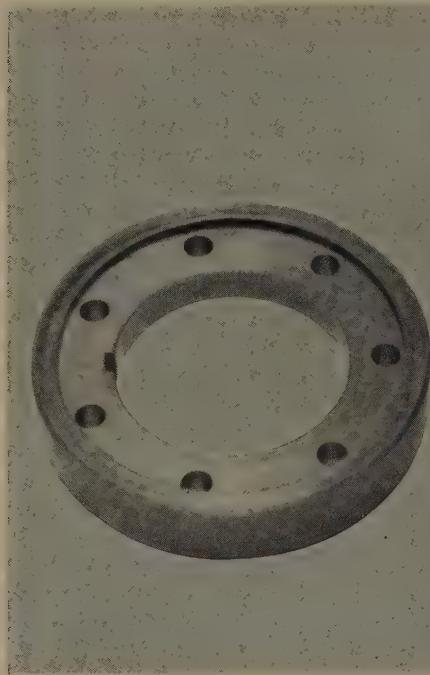
(formerly Industrial Equipment Co.)

303 NORTH ADA STREET

CHICAGO 7, ILLINOIS

Overhead Cranes • Jib Cranes • Monorail Systems • Crane Runways  
Representatives in Principal Cities

**ANOTHER American FIRST**



## *an American "special" broaches*

**7 slots each pass; 320 parts per hour**

Seven external slots are broached on a pump rotor part by this American special two-station 42" stroke, 10-ton broaching machine. Fixtures are designed as posts fixed to the machine base and contain guides for guiding the moving broach pots during the machine stroke.

The operation is very simple—the operator loads two parts and starts the broaching cycle. Safety wedges, which prevent the broach pots from moving down while the operator loads, retract and the broach pots move down broaching the parts. On the return stroke the ejector mechan-



ism strips the parts from the posts and then flips the parts to the side as the broach pots move up. The operator reloads and the cycle repeats producing 320 parts per hour, when operating at 100% efficiency.

You can benefit from the American Way when you want high production at low unit cost. Send a print or sample for the recommendations of the company that designs and builds all three — broaching machines, broaches and broaching fixtures. Write today. There is no obligation.

**AMERICAN**  
*American* BROACH & MACHINE CO.  
A DIVISION OF SUNDSTRAND MACHINE TOOL CO.  
ANN ARBOR, MICHIGAN

See *American* First — for the Best in Broaching Tools, Broaching Machines, Special Machinery



# Introducing

# WEIRKOTE

a new tight-coated galvanized steel  
from WEIRTON

Now—from Weirton's completely new mill—comes Weirkote, a better galvanized steel with a tight protective coating that doesn't crack, flake or peel under even the most difficult fabricating operations.

Weirkote's zinc coating stays uniform, flows evenly with the base metal, holds fast under most rugged treatment. It holds because the oxidized iron-zinc layer commonly found in galvanized steel is eliminated from Weirkote by the modern continuous galvanizing process by which it is made.

You'll find your products easier and cheaper to produce . . . more durable, better looking . . . if you make them with Weirkote. Get the facts today from your Weirton representative, or write Weirton Steel Company, Weirton, West Virginia.

**WEIRKOTE**  
*For better products*

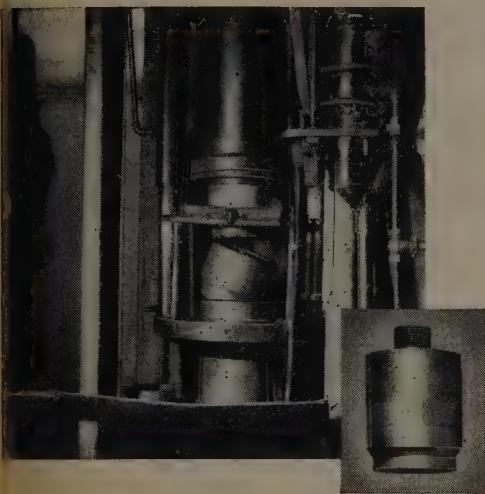
Weirkote is available in coils and cut lengths: gauges 16 to 30 inclusive. Maximum width—42", maximum cut length—168". Weirkote can be obtained to fit any customer requirement. For standard roofing and siding it is guaranteed to conform to A.S.T.M. specification A361-52T.

WEIRTON STEEL COMPANY  
Weirton, West Virginia

NATIONAL STEEL CORPORATION



# Look How You Save by Hard-Facing



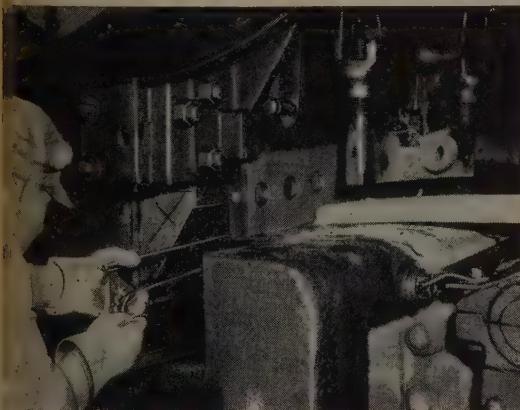
## ◀ PRODUCTION LIFE INCREASED 1000%

This hard-faced punch mandrel has produced 10,000 pipe couplings and still shows no sign of losing gage. Unprotected tool steel mandrels wore out after punching only 1000 pieces, and case-hardened mandrels punched only 500 pieces before they had to be replaced. A 3/16-in. layer of HAYNES STELLITE hard-facing alloy protects the mandrel from wear and galling.



## AVES \$4000 PLUS ▶

building this worn extrusion screw with HAYNES STELLITE alloy No. 1 cost \$2000—\$4000 less than a new screw would cost. And the rebuilt screw will give from 6 to 6 times more service than a new, unfaced screw. The screw is used to extrude rubber from a solid to a semi-liquid state. Wear is the chief problem, and it is effectively resisted by the hard-faced surfaces.



## ◀ SHEAR 4 TIMES THE TONNAGE

These hard-faced blades shear an average of 200 tons of tough alloy billets. This is more than 4 times the average for special steel blades. Hard-facing with HASTELLOY alloy C protects the blades from wear, and they keep a keener cutting edge longer. When the blades finally do wear, they can be hard-faced again at a fraction of their replacement cost.

### **FREE —**

Write for the 40-page "HAYNES Hard-Facing Manual."

# HAYNES *alloys*

Trade-Mark

Hard-facing products made from cobalt-base alloys, nickel-base alloys, and tungsten carbide in the form of rod, wire, and coils.

"Haynes," "Haynes Stellite," "Hastelloy" are trade-marks of Union Carbide and Carbon Corporation.

**Haynes Stellite Company**

A Division of  
**Union Carbide and Carbon Corporation**

**UCC**  
General Offices and Works, Kokomo, Indiana

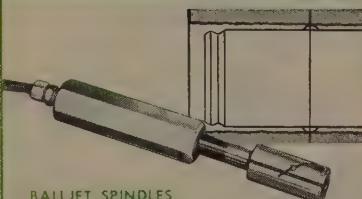
Sales Offices

Chicago — Cleveland — Detroit — Houston  
Los Angeles — New York — San Francisco — Tulsa

# Modernize FOR LOW COST PRODUCTION with Newest Developments In Air Gaging

Already these newly developed practical precision tools are helping produce more and better products at lower cost in innumerable plants throughout the world.

Space restrictions here preclude anything more than the briefest description. Phone, wire or write for specifications, prices and delivery—or call the Sheffield sales engineer in your vicinity.



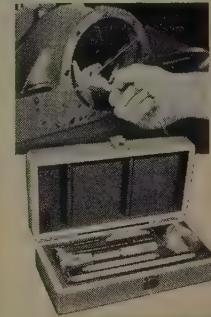
**BALLJET SPINDLES**

For checking holes having finishes rougher than 65 micro-inches, for porous parts, narrow lands or checking to the very end of a hole. Setting is made with gage blocks and a Standard Calibrator. NO MASTER SETTING RINGS REQUIRED—not even one.



**ADJUSTABLE SPINDLE KIT**

One, two, three or four spindles may be quickly assembled from components in the kit, for any size between 1 and 3 inches. Gage blocks are used to set for size and to calibrate air gage for amplification.



**ADJUSTABLE AIRBORE GAGE**

A light, high precision (2,000 to 1 amplification) self-centering bore gage that is easily adjustable from 3" to 12" in diameter. Calibrated by a Standard Calibrator and gage blocks.



**AIRETEST INDICATOR**

Replaces an indicator where more accuracy and higher amplification are required. Always gives precise readings regardless of the direction of approach. No lag—no gears—nothing to wear out of adjustment. Amplifications up to 5,000 to 1.



**AIRELECTRIC HEAD**

Converts air pressure variations at the gaging contact into electrical impulses which actuate classification and segregation mechanisms or machine control devices. Accurate to a fraction of a "tenth".

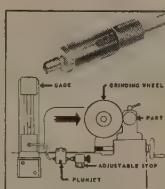


**ELECTRO-PNEUMATIC UNIT**

A self-contained unit of Airelectric Head, indicating dial and signal lights. Easily mounted on the machine to control machine operation by precision measurement of the machined surface. Makes machining automatic. Also used for automatic gaging and segregating.

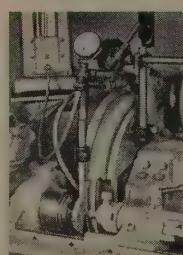
**PLUNJET FEED GAGE**

The key element of the machine "Feed Gage" which eliminates error due to feed screw wear. Also, due to the high amplification, makes it easy to manually control the feed to fractional "tenths".



**PLUNJET CALIPER TYPE GAGE**

Air Gaging Cartridges are used with Caliper Gages for continuous sizing of work on external grinders. Dial is used for approach—PLUNJET brings to final size.



**PLUNJET GAGING CARTRIDGES**

Precise, low-cost gaging elements which you may incorporate in your own gaging fixtures singly or in multiple to measure practically any dimension or geometrical relationship, with tolerances ranging from .0005 to .100.

**GAGE DIVISION, The Sheffield Corporation**  
Dayton 1, Ohio, U.S.A.

**PHONE, WIRE OR WRITE**



# SHEFFIELD

**cost-cutting  
stronger  
more dependable**

Now available... **COPPERPLY**®

A NEW COPPER-PLATED STEEL WIRE  
OF UNMATCHED NATIONAL-STANDARD QUALITY

COPPERPLY

STEEL  
CORE

COPPERPLY, accurately concentric and uniform, is steel wire electroplated with copper to the thickness required. This type wire was originally used for television lead-in installations. Now this unique wire is solving cost problems in many new applications.

Maybe COPPERPLY gives you ideas for applications in your field . . . uses that will result in substantial savings over solid copper wire.

In addition to cutting costs, COPPERPLY obviously is much stronger than copper wire. And National-Standard makes it with a regular or high tensile steel wire core to fill your specific requirements.

*We'll "loan" you an engineer to help you develop any ideas for using COPPERPLY you'd like to explore. It's company policy to give the best service in the industry, in addition to the highest quality special wire and steel products available. Write the National-Standard Company, Niles, Michigan, concerning COPPERPLY. Write the appropriate division listed below on other products.*

SOLID  
COPPER WIRE

DIVISIONS OF  
NATIONAL-STANDARD



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Reynolds Wire, Dixon, Illinois  
Industrial Wire Cloth

Wagner Litho Machinery, Jersey City, N. J.  
Metal Decorating Equipment

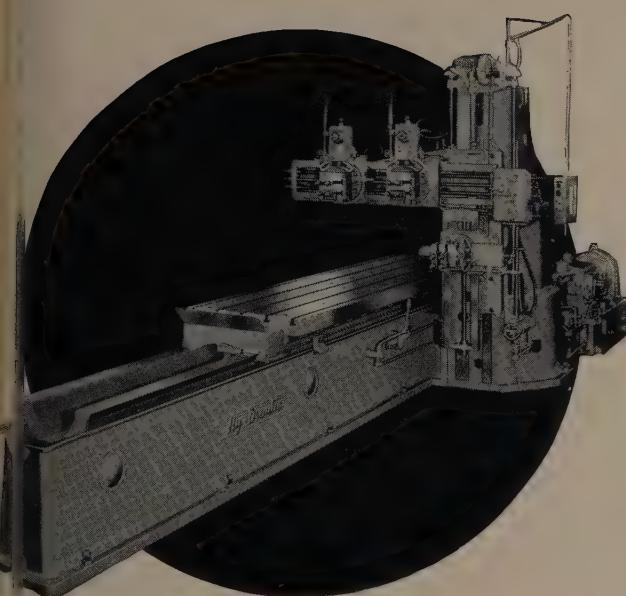
Worcester Wire Works, Worcester, Mass.  
Round and Shaped Steel Wire- Small Sizes

*hydraulic drive...a natural for*



**Rockford Machine Tool Co.**

# reciprocating machine tools



Hydraulic Drive and Feeds, as basic features in modern machine tool design, provide outstanding performance, measured in terms of work quality, high production and low operating cost. We have had over 25 years of experience in applying Hydraulic Drives and Feeds to Shapers, Planers and Slotters.

## *rockford* *hydraulic* *shaper-planers*

*Simplified Controls*

*Quick Set-Up*

*Fast Operation*

*Stepless Speeds*

*Smooth Cutting*

*Fast Reversals*

*Long Tool Life*

*Unmatched for the efficient, economical handling of work that is somewhere in size between shaper and planer capacities.*

*shaping / planing / duplicating / turning*



**Rockford, Illinois**

OPERATION: GOLDFISH BOWL



#### FABRICATED STEEL FOR

Power Plants • Hangars • Stadia  
Bridges • Stores • Office Buildings  
Theaters • Hotels • Apartment Buildings  
Hospitals • Churches • Schools  
Industrial Buildings • Tanks • Bins  
Pressure Vessels • Stacks

For complete  
information, write: THE

• The Manufacturers Trust Company building at Fifth Avenue and Forty-Third Street in New York is a fine example of modern design. Architects: Skidmore, Owings & Merrill. General Contractors: George A. Fuller Company. Structural Engineers: Weiskopf & Pickworth.

#### FABRICATING STEEL IS OUR BUSINESS

Ingalls, the nation's leading independent steel fabricator, supplied the steel for the handsome, modern Manufacturers Trust Company building in the heart of America's largest city.

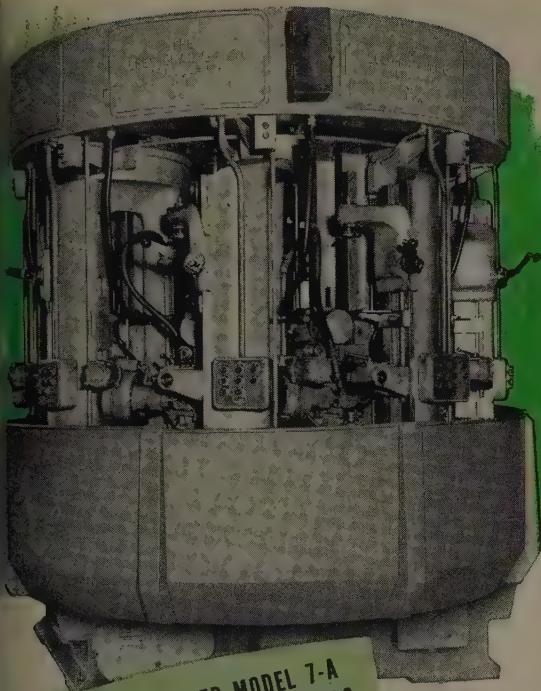
Thousands of commercial and industrial buildings, constructed during the past 44 years and located here and there about the country, are proof that Ingalls can meet any fabricated steel requirement, regardless of size or location. Plants in Pittsburgh, Birmingham, Pascagoula, Mississippi, and Decatur, Alabama, assure *you* of a service that's prompt, efficient and economical.

**INGALLS**  
**IRON WORKS COMPANY**

BIRMINGHAM, ALABAMA

**Sales Offices:** New York, Chicago, Pittsburgh, Houston.

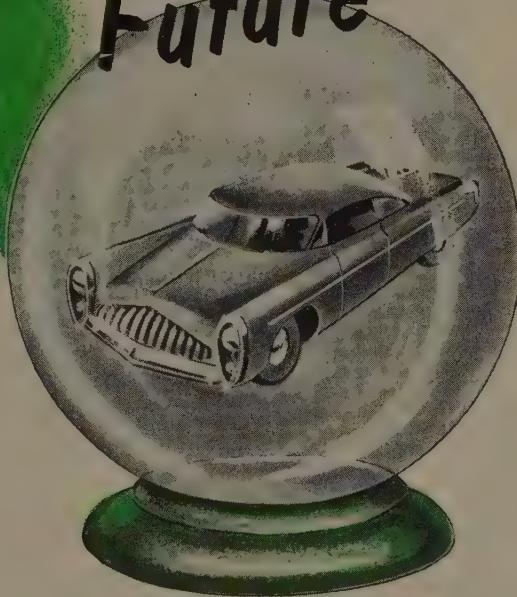
**Plants:** Birmingham, Ala., Verona, Pa., North Birmingham, Ala., Pascagoula, Miss., Decatur, Ala.



LEES-BRADNER MODEL 7-A  
8-SPINDLE ROTARY HOBBERS

- Push-button production controls
- Electric hob shifter
- Electronic counter for longer hob life
- Patented automatic hob in-out mechanism

Engineered for Today  
with Reserve Capacity  
for the  
Future



Things are moving fast these days. The car that was so spanking new and modern yesterday is "old hat" when the new models come out.

The same could be said for machine tools.

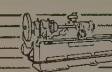
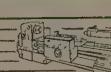
That's why it's important to *look ahead* when buying machines. To ask *more* than "What can it do today?" Tomorrow comes fast and it's important that the tools you buy now have the reserve capacity for your future needs.

Lees-Bradner hobbing machines are engineered for extra capacity. They're built to run longer and at greater speeds than other machines of their type. And because they are semi-automatic the labor savings are considerable.

That's why we can say that when you buy a Lees-Bradner hobber you're buying not only for today but for tomorrow, too.

Your Lees-Bradner representative will be glad to give you the facts. Or write us direct.

*the* **LEES-BRADNER** <sup>®</sup>  
CLEVELAND 11, OHIO, U.S.A. *Company*



MODEL R HOBBER HT THREAD MILLER 7-A ROTARY HOBBERS CRI-DAN THREADING MACHINES

MODEL 40 THREAD MILLER SH SPLINE HOBBER 12-S HOBBER

IF YOU THREAD OR HOB... GET A BETTER JOB WITH A LEES-BRADNER



STRONG JOINT on desk housing is made with Tobin Bronze Welding Rod.

## Office equipment maker uses Tobin Bronze to braze-weld stronger, cleaner joints

On desks and filing cabinets it's important that all corner joints have adequate rigidity and strength, and that they look clean and neat after enamel finishing. Whether they will or not depends largely on the welds at these points.

Columbia Steel Office Equipment Co., Philadelphia, has this problem licked. First, they spot-weld all desks and filing cabinets. Then, units are braze-welded with Tobin Bronze\* Welding Rods (3/32 in.). Columbia says, "Braze-welding with Tobin Bronze provides greater strength at the joints . . . helps to make our equipment more attractive. Our work goes faster, too. Tobin Bronze flows freely, 'tins' quickly, gives strong, neat bonds.

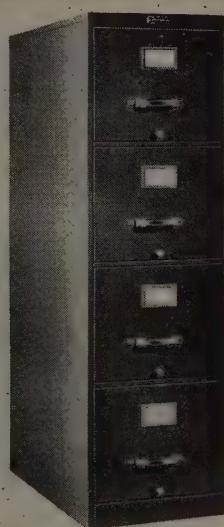
Braze-welding with Tobin Bronze is the fastest, most economical way we've found to do the job."

**ANACONDA** Welding Rods for many types of production and repair jobs are available from distributors throughout the United States. *The American Brass Company*, Waterbury 20, Conn. In Canada: *Anaconda American Brass Ltd.*, New Toronto, Ont.

\*Reg. U. S. Pat. Off.

**ANACONDA®**  
Welding Rods

*Anaconda Copper-372 • Tobin Bronze-481 • Anaconda-997 (Low Fuming) Bronze • Nickel Silver-828 • Cupro Nickel-826 • Everdur-100 • Ambraloy-928 • Phosphor Bronze-351 • Phosphor Bronze-354.*

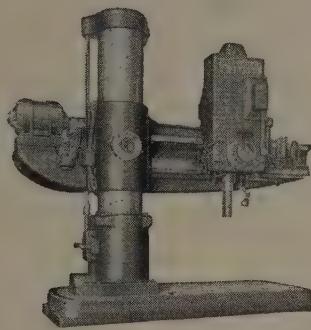


**COLUMBIA** Steel Office Equipment Co. also produces attractive filing cabinets like this one by braze-welding with Tobin Bronze Welding Rod.

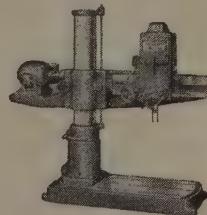
There's a **SUPER SERVICE** for your job...



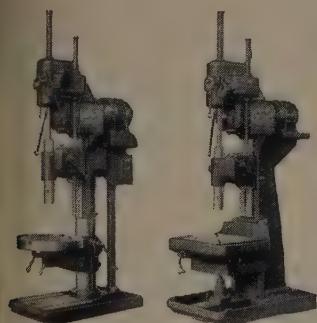
**SUPER SERVICE** Master Radial Drill, as described in Circular R-22, is built in 7' to 12' arm lengths and in 22" and 26" diameter columns. This machine has 36 speeds and 18 feeds powered by motors from 20 to 40 HP.



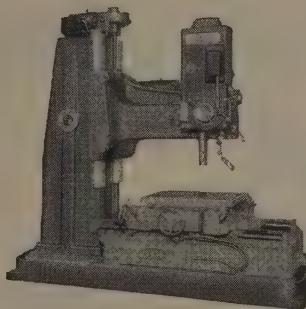
The 36-speed 18-feed **SUPER SERVICE** Radial Drill, as described in Booklet R-29, is furnished in 13 different standard sizes, ranging from 3' to 8' arm lengths and 11" to 19" diameter columns. These machines are furnished with 7½ to 20 HP driving motors.



The 9" Diameter Column **SUPER SERVICE** Radial Drill, as described in Circular R-21C, is built in either a 3' or 4' arm length with 9 speeds and 4 feeds powered with a 3 HP driving motor.



**SUPER SERVICE** General Purpose Upright Drilling Machines, as described in Booklet U-25, are furnished in 21", 24" and 28" sizes. From 8 to 12 speeds and 9 feeds. The machines are powered by either 3, 5 or 7½ HP motors.



The new **SUPER SERVICE** Precision Drilling Machine is especially suited to operations in conjunction with an automatic spacing table. This 36-speed 18-feed 15 HP motor machine is more completely described in Circular FH.



The **SUPER SERVICE** High Production Manufacturing Type Uprights have many of the advantages of the general purpose drilling machines but, due to their simplified construction, they are much more economical. They are furnished in 21", 24" and 28" sizes with 3, 5, 7½ or 10 HP driving motors. Booklet U-27 will furnish you more complete details.

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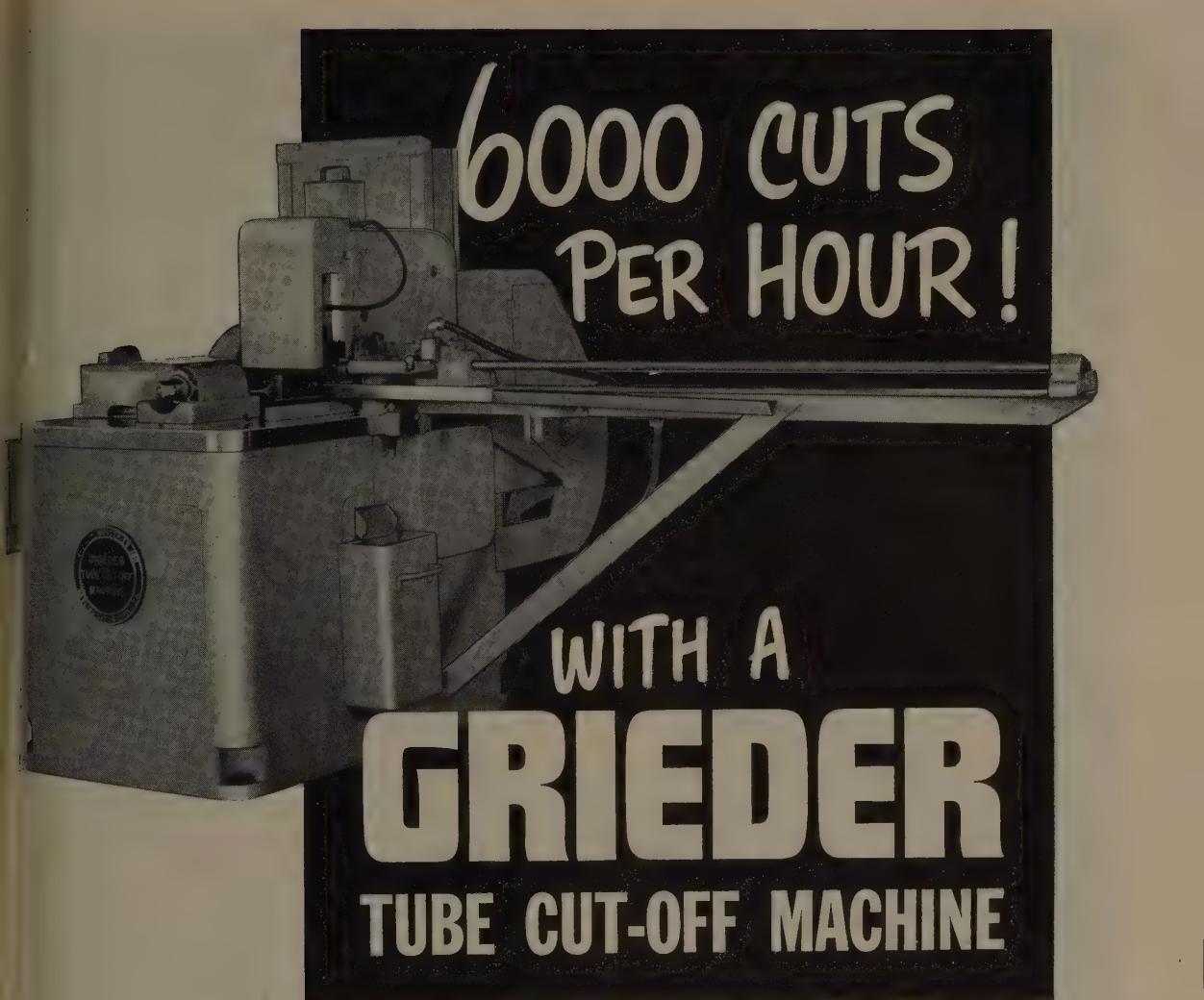
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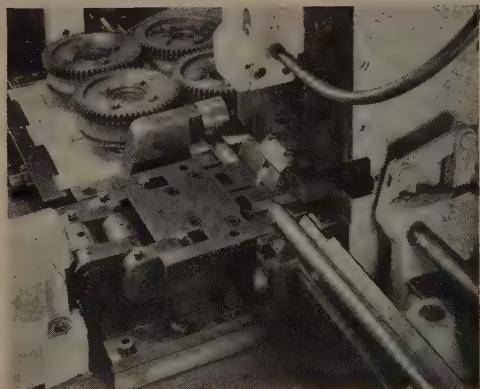


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for better results use  
the **J&L** cold finished steel  
with a reputation for:  
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Jalcase was developed in J&L's metallurgical laboratories to meet the need for a free-cutting open-hearth steel with the mechanical properties required for high quality machined parts.

Today, specifications are standardized within the steel producing industry and S.A.E. and A.I.S.I. numbers have been assigned.

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Designation	Number	Designation	Number
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Jalcase-2	C-1114	Jalcase-8	C-1141
Jalcase-3	C-1116	Jalcase-9	C-1144
Jalcase-4	C-1117	Jalcase-10	C-1144
Jalcase-5	C-1118	{ specially Processed	
Jalcase-6	C-1119		

And, J&L's Jalcase continues to maintain leadership in this group of steels.

When you specify "JALCASE," you can depend upon the qualities that help you obtain better production . . . longer tool life . . . lower overall costs. Remember to say "JALCASE" when you order.

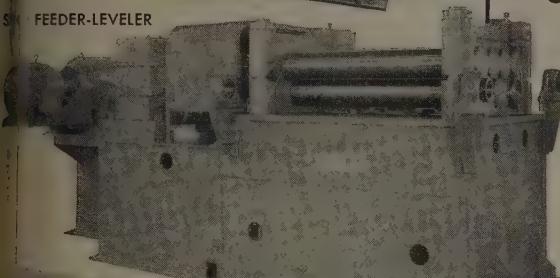
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**Jones & Laughlin**  
STEEL CORPORATION — Pittsburgh

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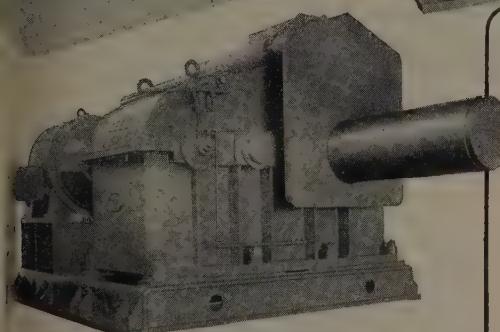


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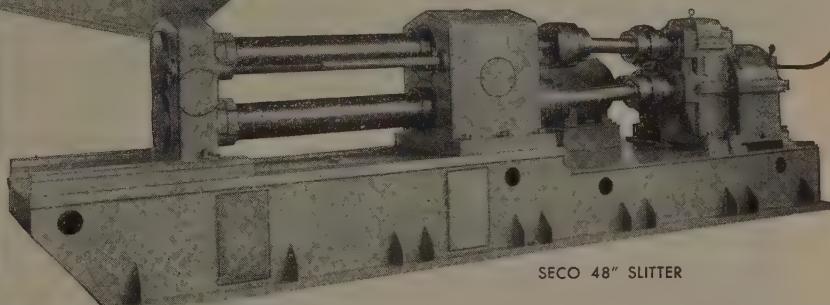


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This rugged new SECO Slitting Line handles steel  $\frac{1}{4}$ " thick in coils 48" wide, weighing up to 32,000 pounds. The efficient, streamlined SECO Slitter, shown below, makes seven cuts in .250" stainless or low carbon steel at slitting speeds of 100 to 400 feet per minute. This slitter has overrunning clutches for pull-thru slitting. Arbors are 9 $\frac{1}{2}$ " diameter with 16" knives.



SECO 48" SLITTER

Exceptional quality and accuracy are built into each piece of SECO equipment—assuring efficient, trouble-free, high production.

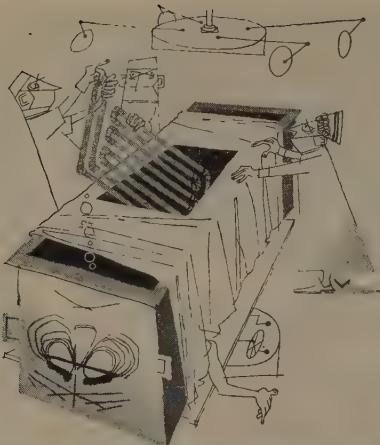
The Payoff Reel (top left) is of the positioning type, with power feed-up. The Feeder-Leveler is, like other SECO equipment, of the most modern design. The Tension Reel (left) has a 54" long automatic block, 22" in diameter, hydraulic stripper, 250 H.P. motor.

Call or write SECO on your requirements for slitters or other cold-rolled strip mill equipment. We're glad to furnish full information—no obligation. Our years of engineering experience and complete plant facilities are at your service.

# SECO

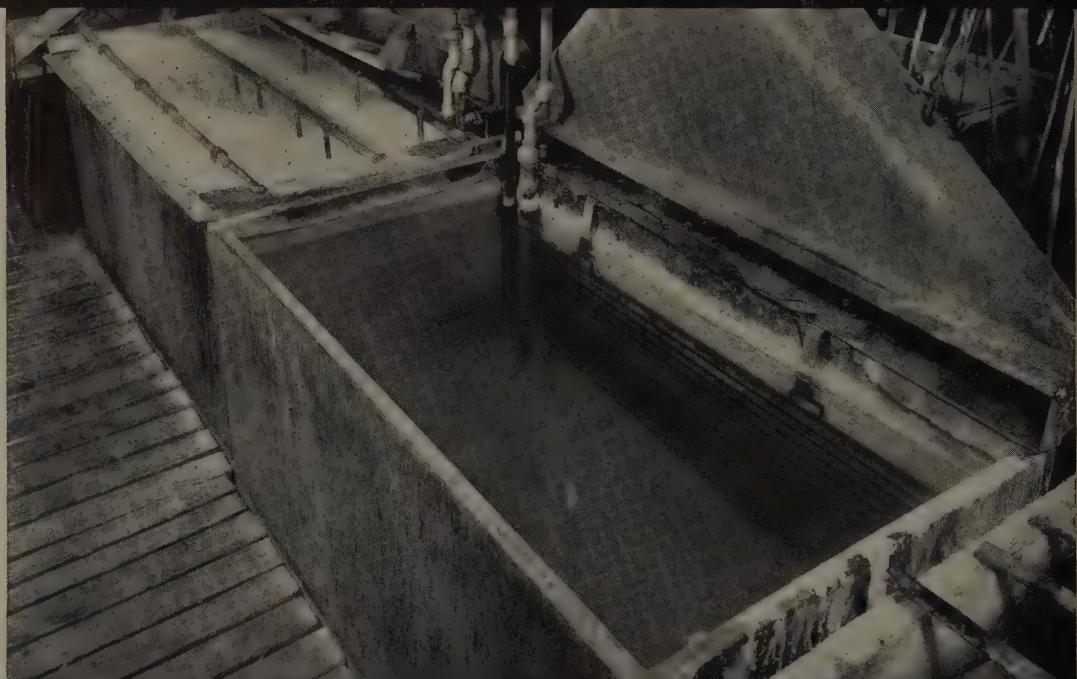
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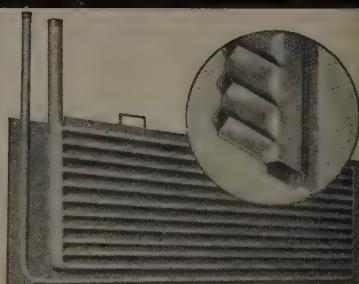
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**PLATECOILS** *cure coil-it-is \**

Addressograph - Multigraph Corporation has considerably reduced their process heating costs by changing to Platecoils instead of serpentine pipe coils for such processes as alkaline stripping, alkaline cleaning and chemical blackening of steel. Addressograph saved through lower initial costs, lower installation costs and a 50% reduction in maintenance costs. Much less space is consumed by the Platecoils and heating efficiency is greatly increased.



**PLATECOILS** *replace pipe coils*  
**for 50% of the cost**

\* Coil-it-is is the constant doctoring of wet processing tanks for pipe coil troubles. It can be cured easily by replacing pipe coils with Platecoils. Immediately, you will notice the difference as Platecoils put new life and profits into your heat transfer processes. They heat or cool 50% faster and take 50% less space in the tank. They save as much as 50% in initial cost and 50% in maintenance costs in addition to overcoming the limitations and operating difficulties of old fashioned and outmoded pipe coils.



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# Metalworking Outlook

## Uncle Sam: Machine Tool Buyer

The government's first substantial machine tool buying this fiscal year has been by Carbide & Carbon Co. acting as agent for the Atomic Energy Commission. The Union Carbide & Carbon Corp. subsidiary has just placed about \$3 million in orders for use at a classified project. More U.S. business for machine tool builders lies ahead before this fiscal year ends June 30.

## Plenty of Galvanized Sheet

There's no truth to the rumors current last week that a sudden stringency in galvanized sheet would lead to a government freeze on that steel product. The U.S. has no authority to take such action even if it wanted to. What led to the rumors is this: Commodity Credit Corp. is in the process of awarding contracts for some 60,000 tons of galvanized sheet to be fabricated into grain storage bins. That's a sizable order, but the industry's capacity for the product is 200,000 tons a month, so there won't be a shortage for other users. Since this job was known to be in the offing, some of the tonnage has already been rolled and set aside.

## Beating the Bushes for Business

Some steel companies are sending customers copies of their weekly rolling schedule. If there are openings, customers can make special orders and get unusually fast delivery. It's all part of the industry's drive to get more business and speed up service (p. 96). Although the information on rolling schedules is most commonly given for plate and shape mills, it is not confined to those two products.

## A Look Ahead at TV

About \$5 billion worth of television sets will be sold within the next three years to some 14 million American families now without TV. So predicts W. C. Johnson, Admiral Corp.'s vice president-sales. He believes "that of the 44 million families living in electrified homes, 95 per cent will have TV within three years." That means that more than 42 million families will have sets compared with today's 28 million, not counting the new families which are being formed at the rate of about 800,000 a year. Replacement demand within the next three years will amount to at least 7 million sets. Mr. Johnson predicts no more than 75,000 color units will be produced in 1954.

## Trade with the Reds?

Don't expect any marked easing soon in trade with Iron Curtain countries. Foreign Operations Administrator Harold Stassen has negotiated an agreement whereby Britain, France and the U.S. will assign foreign trade staffs to study the possibility of liberalizing shipments of nonmilitary items. Procedural plans should be far enough advanced before the end of April to

# Metalworking Outlook

permit discussion of the proposed change with all the NATO countries in a Paris conference. After that, lists of commodities will be gone over to decide what can be shipped. So, it will be months before the exporter can actually trade limitedly with the Communists.

## Industrial Fire Loss Mounts

Checked your fire protection lately? Some 25 per cent of all U.S. and Canadian fire losses in 1954 will probably result from industrial conflagrations. National Board of Fire Underwriters reports that industrial fires caused 24 per cent of the \$1-billion total fire losses in 1953, 23 per cent in 1952. Damage to industry from fire has been steadily increasing.

## Crack-down on Nickel Chiselers

Look for a crackdown on the relatively few sharpies who are operating a gray market in nickel. They are getting most of their metal by misusing the symbols and certifications reserved for defense and AEC programs. Business & Defense Services Administration is investigating four cases. Willful violations will be subject to criminal prosecution.

## Big Labor: Big Investor

No small factor in current stock market gains is the rapidly rising investment in securities by the rich labor unions. Two years ago unions had less than 2 per cent of their assets invested in the market. It's probably as high as 10 per cent now. Real estate, particularly in Washington, is another home for labor's funds. Dave Beck's teamsters will spend \$4 million for their new headquarters in the capital. The machinists have a \$2-million structure going up on Connecticut avenue. The AFL has one planned for the city, too.

## Straws in the Wind

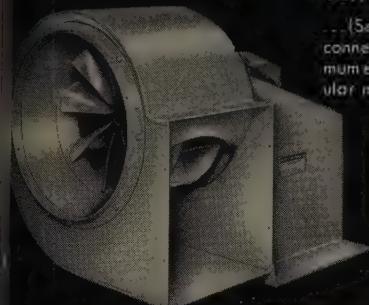
The business readjustments should be "very largely, if not wholly, behind us" before the end of the year, says National Association of Credit Men . . . The scheme whereby defense work is given to a pool of small companies has flopped, acknowledges Attorney General Herbert Brownell Jr . . . In a few months New York Central Railroad will start to haul truck trailers on flat cars; the road may order 400 75-foot cars for the service . . . A boon to business: The \$966 million a year to be spent on federal highway construction in fiscal 1956 and 1957 . . . The Justice department is scrutinizing the whole auto industry for antitrust implications, including the Ford-GM struggle for supremacy . . . Republic Steel Corp.'s first-quarter net income was \$11.1 million; net income per dollar of sales was 5.2 cents versus 4.7 cents in the same 1953 period.

## This Week in Metalworking

A STEEL survey reveals steel buyers expect to purchase 3.7 per cent more of the metal in May than in March (p. 93) . . . U.S. buying of aircraft will decline, but gradually (p. 95) . . . You're literally walking on steel; 6500 tons of cold-rolled strip are used a year in shoe shanks (p. 97) . . . White Motor Co. produces tailor-made trucks on a mass production basis (p. 98).

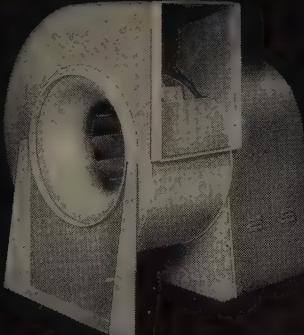
### VENTILATING SET

... (Series 900) direct-connected, for maximum efficiency at popular motor speeds.



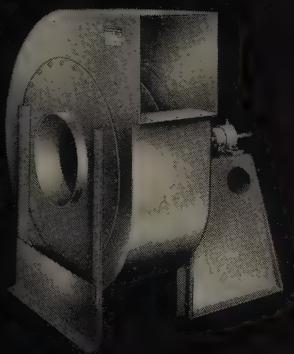
### VENTILATING SET

... (Series 1000) V-belt driven, compactly designed for large capacities and quiet operation.



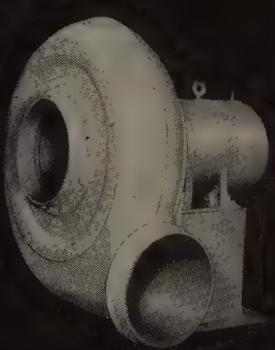
### INDUSTRIAL FAN . . .

Series 700) designed for conveying raw material or waste at high pressure with a wide selection of volume range.



### MONOGRAM FAN . . .

versatile and rugged for collecting and conveying raw materials and waste under severe operating conditions.



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Whatever your air handling problem — smoke, fumes, vapor, dust, wood shavings, granular material or venting . . . these Westinghouse fans are designed to handle or remove them . . . efficiently and economically.

Monogram and Industrial Fans are designed for collecting and conveying materials and waste . . . and permit a wide range of selections to meet the most exacting requirements.

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Each of these rugged, powerful Westinghouse fans will prove to be the best economical solution to your specific air handling problem. And Westinghouse fans offer a *single equipment*

warranty with undivided responsibility . . . an exclusive Westinghouse-Sturtevant feature. Get the fan built for *your* need from your nearest Westinghouse-Sturtevant office today. Or write: Westinghouse Electric Corporation, Sturtevant Division, Hyde Park, Boston 36, Mass.

#### SERIES 900 VENTILATING SETS

Compact, efficient, direct-connected and ready-to-run. Especially suited for small ventilating installations. Radial blade wheel design minimizes problem of airborne dirt and grease. Designed for volumes to 3200 cfm.

#### SERIES 1000 VENTILATING SETS

V-belt driven, self-contained. Adaptable to either indoor or outdoor installations for a wide variety of heating, ventilating or air conditioning

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Permits a wide range of volume selections at high pressure for handling and conveying raw material and waste.

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When your products go on the drawing board for redesign, it may pay you to keep in mind the many advantages of Armco Steel Tubing in special shapes. Tubing is pleasing to the eye. It may be the means of giving your products the extra sales appeal you want.

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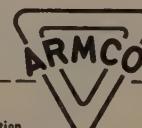
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Armco Tubing is supplied in hot-rolled steel, cold-rolled steel, and Armco ZINGGRIP (steel with a specially applied zinc coating). ALUMINIZED STEEL Tubing is made of a hot dip aluminum-coated steel that resists combinations of heat and corrosion.

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April 19, 1954



## The Oppenheimer Case

Last Tuesday the *New York Times* published two important letters. One, dated Dec. 23, 1953, was from Maj. Gen. K. D. Nichols, general manager of the Atomic Energy Commission, to Dr. J. Robert Oppenheimer, one of the nation's most brilliant scientists and the man who is credited with having "built the atom bomb." The letter informed Doctor Oppenheimer that he was suspended from further access to classified information and employment by AEC until such time as certain allegations to his conduct, veracity and loyalty have been disproved.

Among the allegations in the Nichols' letter are that Doctor Oppenheimer associated with many members of the Communist party, contributed money to it and was at one time opposed to the development of the H-bomb. Also several Communist party members are listed who are alleged to have stated that Doctor Oppenheimer also was a member of it.

The second letter in the *Times*, dated Mar. 4, 1954, is Doctor Oppenheimer's reply to General Nichols. It fills 12 columns and it is an amazing story of a confused, preoccupied scientist who associated with dozens of Communistic organizations, contributed to the strike fund of a Bridges' union, got tangled up in the Spanish Loyalist cause, courted one girl who was a Communist and married another who was the widow of a Communist. His brother was a Communist. Doctor Oppenheimer's letter indicates that much of his social life on the University of California campus at Berkeley involved mixing with Communists or Communist sympathizers.

In spite of all of these suspicious connections, associations and activities, Doctor Oppenheimer has been investigated many times over a long period of years and has been cleared. President Eisenhower has appointed a new board of three members to review his case.

Industrial executives would do well to read both letters in the Apr. 13 issue of the *Times*. The letters serve two purposes. First, they reveal an attitude toward Communism that was not unusual among many top-flight scientists during the thirties. Secondly, they indicate how difficult it is to determine whether association with Communists impairs one's ability to do a job satisfactorily and with loyalty to the boss.



EDITOR-IN-CHIEF

**THE PATTERN CHANGES:** Figures on the distribution of finished steel in 1953 compiled by the American Iron & Steel Institute reflect the effect of a partial transition from a

defense to a civilian economy. The "mix" of steel products consumed (pp. 104, 105) was changed slightly in that the percentage of light, flat-rolled products such as strip and sheets in-

creased, while that of hot-rolled and cold-finished bars—essential to a defense program—declined. Also the automotive industry—leading steel consumer—in 1953 increased its take of steel.

It is rather interesting to note that three market classifications accounted for practically half of the finished steel shipped in 1953. "Jobbers, dealers and distributors" took 18.56 per cent of the total, the automotive industry 18.30 per cent and "construction and maintenance" 12.38 per cent. The total for these three leaders is 49.24 per cent.

\* \* \*

**IMPORTANT CUSTOMERS:** Beyond these three leaders in the purchase of steel are a number of consumers of special interest. Fourth in percentage of consumption are containers, which for 30 years have been making a strong bid to increase their rank as important customers of the steel industry. In 1953 (pp. 104, 105) they accounted for 7.55 per cent of shipments of finished steel.

Ranking fifth is rail transportation. At one time, probably not more than 35 or 40 years ago, the railroads were the No. 1 customer of the steel industry. They still are important, but in 1953 they consumed only 5.97 per cent of the industry's shipments of finished steel.

Sixth among steel's customers is the classification "machinery, industrial equipment, tools." Last year this consuming group accounted for 5.40 per cent of the shipments of finished steel. If the measure of consumption were computed in dollar value rather than in tonnage, this "machinery, equipment and tool" group would rate higher in the scale of consumption.

\* \* \*

**A THIRD TO AUTOMOTIVE:** Before we dismiss the subject of the distribution of steel, it may be well to look at the figures on alloy and stainless steel which the American Iron & Steel Institute has been developing in recent years. It is important to note that of 5,817,796 net tons of alloy steel, other than stainless (p. 105) shipped in 1953, 1,997,907 tons or 34.3 per cent went to the automotive industry. Another 1,167,425 tons, or 20 per cent went to "machinery, industrial equipment, tools, electrical machinery and equipment."

As to the distribution of stainless steel, 25.8

per cent of the 601,708 net tons shipped in 1953 went to warehouse customers and 21.2 per cent went to the automotive industry. The remainder was widely scattered, with "appliances, utensils and cutlery" leading.

\* \* \*

**NEW ROLE FOR TOOLING:** With the annual conference and show of the American Society of Tool Engineers scheduled for Apr. 26-30, in Convention Hall at Philadelphia, the editors of this publication have gone to great lengths to present in this issue (pp. 135-188) not only the highlights of events that will take place in Philadelphia but also a studied appraisal of the new role which tool engineers are destined to play in the development of our manufacturing techniques.

Under the general heading of "Tooling for Competition," the editors develop the theme that the tool engineer is increasingly being called into conferences where his experience is considered before final, top-level decisions are made by management. Also there is presented a check list of items on which careful attention to detail may easily cut tooling costs appreciably. Finally 21 experts express their opinions in a Tool and Die Materials Forum.

\* \* \*

**OUTLOOK IS FAVORABLE:** It is natural that at this stage of the transition from the restrictive influences of winter to the encouraging factors of spring, industrialists almost automatically take a new, fresh view of the business outlook. From the turn of the year to the present day, the prospect has been quite depressing. Employment, while at new high levels, has been off enough to classify from three to four million as unemployed.

This is not alarming when compared with figures from 1933 to 1950. We had more unemployed in 1949 than now, and no labor union leader, "new dealer" or "fair dealer" uttered a single word of protest. Fortunately these are fairly reliable signs that our economic adjustment is progressing favorably and that we are not in for a demoralizing recession. In fact, current news is definitely more encouraging than depressing. Before long, we'll be on the upturn again.

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You'll see how one of the world's largest ball bearing producers keeps ahead in this ever-changing world.

You'll see at Federal automated production that keeps quality at a peak.

You'll see at Federal the newest precision machines—modern machines that make yesterday's wide tolerance bearings as primitive as the equipment they served.

You'll see, too, the latest quality control instruments and inspection methods in use at Federal.

Keep ahead or fall behind is the order of the day. Most alert to that are the purchasing agents and purchasing powers who won't wait till tomorrow for something that can be better today.

These purchasing powers are seeing how yesterday's No. 2 sources of supply have earned the right to become today's No. 1. And they are fast coming to recognize Federal ball bearings as the *modern* leaders in their field.

**Federalize**—and you've modernized.

**Federalize**—and you're ahead!

*One of the world's largest ball bearing manufacturers* THE FEDERAL BEARINGS CO., INC.

POUGHKEEPSIE, N. Y.

Producers of the *Modern* ball bearing

**Federal**  
Ball Bearings



# STEEL

when you  
need it



• Noon or midnight the loading area of this Ryerson plant looks much the same because we work 'round the clock to make sure that you get Ryerson Steel when you need it. Carbon steel, alloy steel, stainless—every kind is on hand, in practically every shape and size. Your requirements can be set down where you want them, quickly, cut to size and ready for immediate use. Just call the nearest Ryerson plant.

PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N.C.  
CINCINNATI • CLEVELAND • DETROIT • PITTSBURGH • BUFFALO • CHICAGO  
MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

# RYERSON

# STEEL BUYING in May: MODEST GAIN over March

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 2 3 4 5 6 7 1  
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A weighted average of purchasing agents' plans reveals they'll buy 3.7 per cent more steel next month than last. That's not sensational, but it's at least an improvement

## STEEL SURVEY SHOWS:

- 46%** of buyers expect no change
- 20%** expect to buy less
- 34%** expect to buy more

**BUSINESSMEN**, often their own best business barometer, foresee a light upturn in steel buying for May compared with March, 1954. Using steel buying as the indicator, STEEL has made another of its continuing surveys of metalworking for the answer to the lay's most perplexing problem — what kind of business weather lies ahead?

**In Thousands of Tons**—Responding purchasing agents revealed steel buying on a weighted average will increase 3.7 per cent in May, 1954, over March, 1954. That means instead of the 7,290,000 net tons of ingots and steel for castings as produced in March, steel mills' outturn might be closer to 7,560,000 net tons in May.

Results of STEEL's survey do not herald a sensational shift in business activity; but the weight of the respondents' answers were on the side of cautious optimism.

**Who Sees What?**—The 20 per cent of the respondents, who foresee a decline in their steel buying, believe the dip will amount to 34 per cent on the average. There were 34 per cent of the respondents who forecast an increase in their buying and who believe the rise will amount to 33 per cent on the average.

Except for buyers of long lead time items, respondents were reluctant to express an opinion of

their steel buying prospects beyond May. However, one-third of the respondents said they believe inventories will increase within the next three months. Greatest optimism for larger inventories came from the Midwest; the least amount of optimism regarding inventory increases was found in the South. Without a crystal ball, respondents said they were forced to tack reservations on such predictions. A few indicated steel buying policy would hinge on the drift of labor relations in the steel industry in May. Another handful cited

the \$1.1 billion slated for Indo-China war aid for fiscal 1955 as the probable determining factor in their steel buying after May.

**Quick Reflection**—Majority of replies to the survey carried the overtone of extreme caution with words to the effect that "May purchases in large measure will be determined by April sales." This hand-to-mouth steel buying means any rise or fall in business activity will be reflected quickly in the volume of steel purchases.

And as that can be foreseen now, there's a slight lift coming in May.

## UAW Union Votes Out Incentives at Willys Plant

THE 10 PER CENT pay cut which Willys Motors Inc. production workers in Toledo, O., were supposed to have voted themselves last week was actually a vote in favor of elimination of an incentive pay plan in favor of a proposed bonus pay plan. The bonus plan payments may make up any present loss in wages to workers.

Ten per cent represents the maximum which can be saved in wage costs by elimination of incentives. About 7000 Willys' workers earn an average weekly pay of \$80; top savings could therefore be about \$56,000 a week.

**Put to Use**—The additional capital thus saved will be used

for production and engineering changes which will in turn produce surpluses to be paid as bonuses later, it's planned. Such bonuses would be administered by a joint committee of company and union officials yet to be agreed upon.

Production workers, members of Local 12, UAW-CIO, have authorized their committeemen to set up a special committee to study the possibility of a bonus arrangement.

**No Indication**—There was no immediate indication whether the plan adopted at Willys' Toledo plant will be adopted at other Kaiser Motors Corp. plants, such

as the assembly plant in California, the sport car plant in Michigan, and the stamping plant in Shadyside, O.

Vote in favor of elimination of incentives by union members at the Toledo plant was practically unanimous.

## More Hours, Fewer Workers

Wage earners in the steel industry worked more hours per week in February than in January, but there were fewer workers, according to American Iron and Steel Institute.

Weekly average per worker was 37.2 hours in February compared to 35.7 in January and 40.7 in February, 1953. Employment dropped 1.4 per cent to 636,100 from January's 644,900, but employment in the industry of 640,500 for the first two months of the year was higher than the average for any postwar year before 1951.

Average hourly payroll cost to the steel industry for each wage earner in February was \$2.299, an increase from January's \$2.294 and considerably above the February, 1953, figure of \$2.208. With the inclusion of the cost of pensions, social security and insurance on the basis of the 1953 average, the February cost would be about \$2.47.

Total payroll estimated for February was \$236.5 million compared to \$251 million for January.

## Westinghouse Sales, Earnings Up

Westinghouse Electric Corp. sales for the first two months of 1954 were 11 per cent above the corresponding period of last year and earnings were also substantially higher, announced Gwilym A. Price, president, at the annual stockholders meeting.

In outlining Westinghouse prospects for 1954, Mr. Price detailed major phases of the planning program, including strengthening of the company's sales, marketing and advertising organization; increased production; introduction of new products and elimination of unprofitable lines; extension of research and engineering programs; cost reduction; and management development.

## Diversification Planned

**Climax Molybdenum Co. looks to alloys and new metals for widening operations**

CLIMAX MOLYBDENUM CO., New York, is planning further diversification in the field of alloys and new metals and expansion of its uranium operations on the Colorado plateau.

In announcing the program, Arthur H. Bunker, president, also said that the company has completed its \$35-million molybdenum expansion program at Climax, Colo., increasing daily capacity from 15,000 tons of ore to 27,000 tons.

**Management Shifts** — To carry out the diversification program Carroll L. Wilson, formerly general manager of the Atomic Energy Commission, has been moved from his post of president of Climax Uranium Co., a wholly owned subsidiary, to director of industrial development of the parent company. He will remain a director of Climax Uranium. John H. White Jr. succeeds him as president of the subsidiary.

Climax Molybdenum's production, sales and earnings rose steeply in 1953. In comparison with 1952, production was up 56 per cent, from 23,874,408 pounds of

molybdenum to 37,306,341 pounds; sales increased about 40 per cent; and earnings after all taxes and charges rose 60 per cent, from \$6,071,519 to \$9,717,000.

**Thorium, Too** — The company's diversification program in 1953 resulted in the acquisition of several thorium prospects in Colorado and the adding of more than \$1 million to its net oil and gas investments.

Capacity operations of the company's Climax, Colo., molybdenum facilities is assured by government contract until some time in 1956. A 5000-ton-per-day production from low-grade ores is assured by government contract until mid-1962.

The government's removal last June 30 of all domestic controls on the sale of molybdenum and the lifting of export controls (except for licenses) in January indicate that there is no longer a shortage of the metal.

## Kaiser Boosts Foil Production

Kaiser Aluminum & Chemical Corp., Oakland, Calif., expects to boost production of aluminum foil by midsummer to 18 million pounds a year at its Permanente plant. Current production is about 12 million pounds.

New equipment installed in the plant includes a high-speed 60-inch Loewy mill capable of rolling foil to a maximum width of 54 inches at 3000 feet per minute. The Permanente plant has been operating with rehabilitated and modernized mill equipment bought by the government from Germany under the reparations agreement.

## New Labor Law for S. Carolina

The "right-to-work" law just signed by the governor of South Carolina is "tough" from the viewpoint of labor union leaders.

In addition to outlawing union membership or the involuntary payment of dues or fees as a condition of employment, the act carries fines and imprisonment for violators and permits injured persons to sue for damages. It also outlaws interference with the right to work by mass or violent picketing. South Carolina is the 16th state to adopt such a law.



### Dunk Test

Glorified "wagon wheel" is part of equipment used to test unions under water at Crane Co.'s Chicago Works

# Aircraft Output To Slip

U. S. cuts will be gradual as emphasis shifts to quality, development, cost-cutting

AIRCRAFT industry production rates will soon be reduced, but they will be gradual and over a substantial period of time.

That word comes from Roger Lewis, Assistant Secretary of the Air Force for Materiel. He spoke at the Society of Automotive Engineers Aeronautic Production Forum last week in New York.

**New Look**—As our air strength now approaches 115 wings, we are entering a period of orderly transition from mobilization rates of production to sustaining and modernization rates of production, said Mr. Lewis. Quality and readiness are now the Air Force's "critical twin objectives" as military forces are tailored to provide security through an "age of peril" rather than to deal with a threat in a specific D-Day, he pointed out.

Describing our present aircraft, engines, accessories and other equipment as probably the best in the world, Mr. Lewis told the engineers it is neither as good as we can make it nor as good as it must be. "We still do not get it soon enough and we still pay too much for it. We do not always have the right tool for the job and what we get does not always work."

**No Compromise**—The Air Force is reducing number of letter contracts and placing more fixed price contracts to get operations on a more orderly business basis. It will require demonstration of a new product before committing it to quantity production. Compromises against development in favor of production will no longer be necessary.

Industry's part, said Mr. Lewis, is to give as close attention to simplicity and reliability of its product as it gives to quality, and to make certain that when the prime item is delivered the necessary special handling equipment, spare parts, training devices, operating instructions and other supporting elements of the product are delivered at the right time and in the right quantity.



**Cylinder Housing Cast for Huge Extrusion Press**

Main cylinder housing for a 12,000-ton extrusion press is shown above. The casting weighs about 363,000 lb and was cast at the New Castle, Pa., plant of United Engineering & Foundry Co., Pittsburgh. The press is being designed and built by Lombard Corp., Youngstown, for the Air Force as part of the heavy press program. The installation is to be at Harvey Machine Co. Inc. plant in Torrance, Calif.

## Help on the Way for Dealing with Subversives

HELP for employers in dealing with subversives on their payrolls may be forthcoming in a bill being prepared by the Butler subcommittee of the Senate Judiciary Committee.

The bill, being readied with bipartisan support, would force Communist-dominated labor unions to register under the Internal Security Act; permit removal from defense-important industries of employees who might be security risks; effect broader application of sabotage laws; extend the statute of limitations in noncapital offenses; and add various other get-tough provisions for handling Americans of questionable loyalty.

**Two Reversals**—Need for more teeth in subversive-handling legislation was pointed up by two decisions of the Supreme Court on Apr. 12. In each case the Supreme Court refused to review decisions of lower courts: One held the National Labor Relations Board lacked power to inquire into the truth of non-Communist affidavits filed by officers of the United Electrical, Radio & Ma-

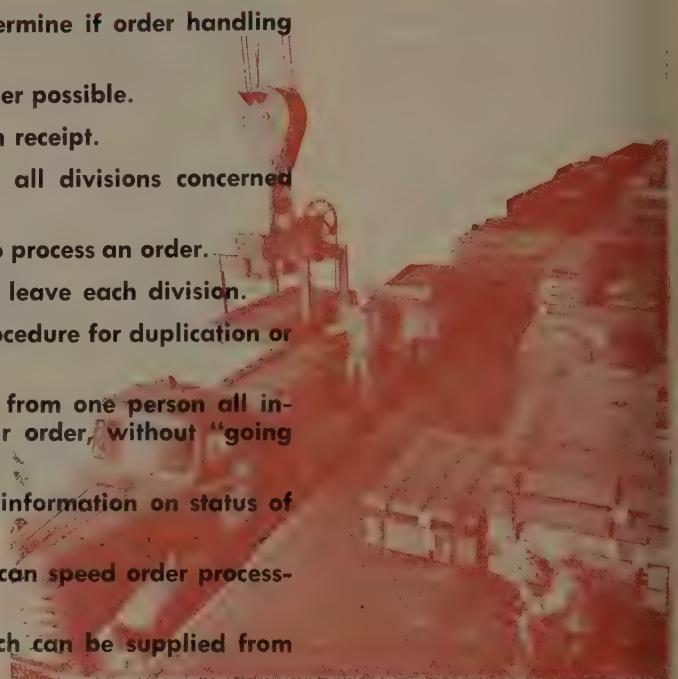
chine Workers of America union; the other denied the right of the NLRB to withhold certification of a union that won a bargaining election if an officer of the union is under indictment for filing a false non-Communist affidavit.

The latter case is the International Fur & Leather Workers Unions of the U. S. & Canada, whose president, Ben Gold, was convicted Apr. 2, 1954, of falsification in his affidavit.

**Problem and Solution**—Guy Farmer, NLRB chairman, has said that employers, who claim the practical necessity of getting along with their unions prevents them from firing subversives, are doing less than their patriotic duty. Yet, Mr. Farmer and other administration officials realize there can be no effective solution to the problem until the federal government obtains powers to deal with it.

That's why the administration is seeking the Butler subcommittee bill to empower the Subversive Activities Control Board to root the Communists out of industry.

- ✓ Organize a plant committee to determine if order handling can be expedited.
- ✓ Telephone or teletype orders wherever possible.
- ✓ Acknowledge orders immediately on receipt.
- ✓ Send copies of incoming orders to all divisions concerned without delay.
- ✓ Allot a time limit for each division to process an order.
- ✓ Record time when orders enter and leave each division.
- ✓ Analyze filing systems and order procedure for duplication or red tape.
- ✓ Make certain customers can obtain from one person all information needed on status of their order, without "going through channels."
- ✓ Provide plant managers with clear information on status of each order.
- ✓ Determine if new office equipment can speed order processing.
- ✓ Build a larger supply of items which can be supplied from stock.



Pittsburgh Steel

## Steel Firms Adapt Retailers' Ideas

The object is to cut down waste motion on order processing and speed deliveries. The added service costs steel companies more, but it pays off in customer relations

"WE'RE PROCESSING ORDERS faster than ever before. We have to—to make a sale!" That's how a New York sales executive reacts to new trends in purchasing that are bringing a revolution in order handling techniques at steel companies.

Fabricators with low inventories demand quickest possible delivery. Mills today are rushing to fill orders they would have reluctantly refused last year.

**Foresight** — Steel management didn't wait until the fire started to buy an extinguisher. While still in a sellers' market more than a year ago, they moved to meet potential demands for speedy order handling. As a result of measures taken then, steelmakers can now offer faster service.

"Need for revision of order handling and processing procedure was realized by Keystone Steel & Wire Co., in 1952," sales officials of the Peoria, Ill., firm report. "After four months' study of in-

ventory controls, filing systems and order procedures, an accelerated system of processing orders was initiated by the industrial sales division in April, 1953."

**Close Analysis**—"A committee in our company studied every phase of order handling for more than a year, preparing for return to the normal 'buyers market,'" says the vice president of a major Pennsylvania steel producer.

A task force to speed deliveries is Pittsburgh Steel Co.'s answer to the mounting consumer demand for quick service. There, a committee is streamlining order handling and product flow under supervision of Marvin J. Bair, general manager of sales. The committee analyzes all company operations, beginning at basic steel production points.

Compact closely-knit steel companies can respond to growing demands for quicker delivery with little friction. Great Lakes Steel Corp., Ecorse, Mich., and Sharon

Steel Corp., Sharon, Pa., for example, report they can easily handle orders with a minimum of lead time today.

**Rapid Service**—First step towards quicker handling of orders is speeding answers to inquiries for service. "We use telephone and telegraphic communication between district and home offices much more than we did last year," say salesmen of National Tube Division, U. S. Steel Corp., Pittsburgh.

In receiving orders at Sharon Steel, salesmen transmit a brief copy of the order to Sharon by teletype. Often production has started on that order before final confirmation is received in Sharon. "Red tape is cut to a minimum. To further serve customers wanting to know status of an order, we offer easy access to top management," adds R. Garlick, assistant vice president.

**Quicker Mill Handling**—A second step toward smoother order processing lies in new techniques of mill management which help speed orders to completion. At Allegheny Ludlum Steel Corp.'s Watervliet, N. Y., plant, a bulletin board charts progress of each order. Clear information on order

is available to the plant manager at a glance.

At Pittsburgh Steel each division has its allotted time to process orders," says Mr. Bair. "Mill schedules are arranged to fill orders when requested, not when it best suit the mill cycle of operation. Result is more attention to the individual customer's needs."

**Paperwork**—Third target of campaigns to speed order handling is office procedure. "Quick handling of individual orders was not important last year, when orders were made three or four months in advance," a midwestern sales manager admits. "Now we keep the customer informed of progress this order all along the line by sending him duplicate copies of various forms. We make notations on each order when it arrives in a certain department and when it leaves. If we find the order moved slowly, we know where to ask for an explanation."

Shoemakers can fill a growing number of such items as merchant service products from stock. To the ever products they devote as much attention to individual orders as possible.

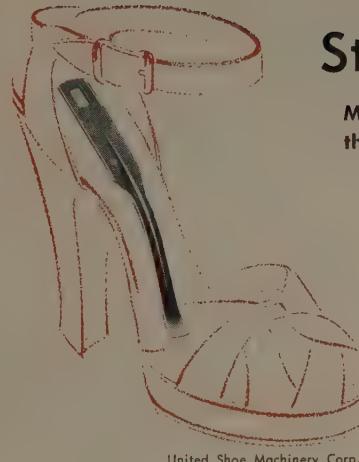
**Pro and Con**—Individual attention costs money, of course, and also leads to some disgruntled salesmen. But the advantages of faster service lead to increased business, and that's all-important when the ingot rate is hovering at 70 cent or less of capacity.

Keystone's industrial sales manager, Ford P. Schusler, says, "Our customers are enthusiastic about quick service." In those seven words, that's why it's here to stay in this steel buyers' market.

### Growing Market for Abrasives

The growing popularity in the granite cutting industry of a high-speed wire saw is making that industry a major sales market for abrasives grit manufacturers, according to Richard R. Harvey, manager of abrasive sales for Electro Refractories & Abrasives Corp., Buffalo.

Between five and ten per cent of the silicon carbide produced for abrasive purposes last year was used by granite fabricators, and only 1954 orders indicate the market is expanding.



United Shoe Machinery Corp.

**SHANK'S MARE**, man's first and still most dependable transportation, consumes approximately 6500 tons of cold-rolled steel strip annually.

Sons of St. Crispin (patron saint of shoemakers), by sticking to their lasts, build into footwear an estimated 540 million steel shanks in close to 270 million pairs of shoes a year. Thus, without realizing the fact, most people are walking on steel.

**Spring in Your Step**—Functionally, steel shanks support the arch like a bridge, anchored at the heel and spanning the arch. Fitted between the inner and outer sole, the steel shank is the most durable part used in shoemaking. About 17 companies make shoe findings, including these shanks. Metalworking operations involve cutting and shearing, stamping, punching, forming, heat treating and bright finishing.

Most men's shoes are built with steel shanks, accounting for nearly 116 million pairs. Military and service shoes, with special shanks, account for 3.5 million more pairs. The standard military items are uniform, but shanks for civilian footwear include scores of variations—flat, oval, fiddler, and ribbed—depending on the wood lasts over which the shoes are made. All shoe manufacturers have their own range of lasts, and shanks are formed specifically to those requirements.

**Ladies Need Variety**—Women buy more shoes than men, nearly 4.0 pairs per capita compared with 1.90 for each man. Total women's

## Steel's in Step

Most of us walk on steel—thanks to the shanks in the instep of our shoes

footwear production, including slippers, approximated 503.6 million pairs in 1953. Though the ratio of steel-shanked women's shoes to total women's shoe output is smaller than the ratio for men's shoes, the actual number of shanks built into women's shoes is larger. High-heeled shoes require steel shanks, and the elements of style and fashion involve a much larger range of lasts and shanks.

Steel shanks are fabricated of 0.50 carbon cold-rolled strip in widths 0.25 to 1.00 inch when sheared and formed with the grain for length and 3.00 to 6.50 inches wide when sheared across grain for width. The larger volume is made from the narrow widths in progressive operations for punching of tack-holes, stamping, forming, shearing and cutoff. The strip gage most widely used is .057 followed by .050, with rather sharp declines for .040 and .032. The first two of these gages are widely used in production of shanks for women's shoes, with men's and service footwear utilizing .040 gage to a greater extent.

**Stepping It Up**—Shank machines are high production units, forming and shearing speeds varying according to design and amount of metalworking required. The average output for the fiddle design is 160 per minute. Most steel shanks are tempered and hardened in conveyor-type salt bath furnaces. The annealing-heating cycle is approximately one hour, including the bright blue finishing operations.

The demand for shank steel in women's shoes parallels female population growth, but demand in men's footwear lags behind the male population growth. Because more men use a car than women, the auto has been blamed for this deplorable situation, but one shoe executive thinks the industry may be making men's shoes that wear too long. Special and more special-purpose shoes for men are needed, he says.



Photographs by Dwight Boyer, Cleveland Plain Dealer

Rear-view mirrors are installed on the cab assembly line at White's Cleveland truck plant

## White Motor Co.—

# Where Trucks Are Tailored to Measure

"THE MAN from White Motor is here to measure you for a fleet of trucks."

Fanciful perhaps, but not outside the realm of possibility for White Motor Co., Cleveland, which has been tailor-making trucks since the turn of the century.

White trucks are born from a combination of some 60 different models and nine different engines. Each final product has modifications in such components as brakes, axles and transmissions to fit the special work it has to do.

**Cut to Measure**—The customer who wants a White truck doesn't pick one out on the salesroom floor. Instead he fills out an "application." He tells White the kind of loads, terrain, climate and state regulations the truck will have to contend with. Then White engineers tailor a truck to fit.

Such tactics may sound high-handed, but for White they pay off. In 1953 the company sold 14,973 units for a net sales total of \$167,384,914, a record by \$17 million over 1951, next best year. As

effective counter to a reputation for high prices, White trucks frequently run 125,000 miles without an engine overhaul.

**Tip Your Cab**—Much of White's success can be laid to imaginative engineering. Obvious example is the White "3000" line with the



Truck chassis is flopped over for engine and cab installation. Transmission, springs, air tanks and piping are installed with chassis in inverted position.

king cab. In these cab-over-engine trucks the whole cab flips forward to give unhindered access to the engine and front axle. White developed its tilting cab ideas and a patent acquired from Sterling Motor Truck Co., Milwaukee, since 1951. Sterling vision of White. During 1953 White continued expansion by purchase of Autocar Co., maker of heavy-duty trucks. White's new Autocar Division will move to a new plant at Exton, Pa., this spring.

Direction of its expansion indicates that White will continue to seek its customers in problem areas like that of the Nashville, Tenn., trucker who needed phenomenally stubby tractors to haul 35-foot trailers in states which impose a 45-foot tractor-trailer limit.

White squeezed the tractor length under the limit by tilting the diesel engine 22 degrees, got an order for 140 as a result.

Other sources for the White income include a series of industrial engines introduced in 1952 and a Canadian subsidiary with offices and factory in Montreal. During 1953 the company discontinued its unprofitable motor coach operation, but later this year will bring it a rear engine drive school bus chassis to supplement its present line of conventional school busses.

## Antitrust Speedup

**Justice officials hold more consent judgment parleys before filing civil complaints**

MORE CONSENT judgment negotiations in antitrust cases are being held before the filing of the civil complaint.

Stanley N. Barnes, assistant attorney general, outlined the procedure before the Antitrust Section of the American Bar Association. By holding informal parleys before the formal proceedings, he aims "to avoid freezing either government or defendants' attitude into publicly expressed positions."

**Both Sides Gain**—Consent judgments offer several advantages over formal litigation to both defendants and the government, according to Mr. Barnes. For example, judgments entered before trial are exempt from use as *prima facie* evidence by plaintiffs in treble damage suits. On the other hand, final judgments or decrees rendered in government antitrust actions against the same defendant can be used as *prima facie* evidence of all issues determined in the earlier decision. By negotiating a consent judgment, defendants also avoid possible unfavorable publicity of a long trial.

On the government's side, "consent judgments spell . . . effective enforcement without the cost of protracted trial." During one sample period, the average litigated case endured some 66.2 months from complaint to entry of final judgment. Consent settlements during the same period averaged only 29.7 months.

Consent judgments are applicable only to civil cases, and requests for them will be denied where the division contemplates criminal proceedings. Prefiling negotiations will also be denied where an important issue of law is involved or where a prolonged delay might weaken the government's position.

## Senate Hears Defense Reports

The nation is 122,000 freight cars short of the 1,865,000-car mobilization minimum, Defense Trans-

port Administrator James K. Knudson told a Senate Appropriations subcommittee. He said there may be a shortage of freight cars this year if there is a large grain crop.

## Titanium Process Developed

Union Carbide & Carbon Corp. has developed a new, low-cost method for producing titanium sponge. The firm has been negotiating with the government for a contract to supply 4000 tons of titanium sponge at the current market prices of \$4.50 to \$5.00 a pound.

## Defense Building O.K. Sought

A bill to provide additional construction totaling \$896,976,600 at military and Alaska Communication System installations was submitted to Congress by Department of Defense.

The bill includes \$110,325,000 for aircraft control and warning systems. Authorization is also requested for facilities required by the 137-wing Air Force.

Projects include construction at 195 continental U. S. installations.

## AEC Appointments Announced

Atomic Energy Commission named Alfonso Tammaro as assistant general manager for Research and Industrial Development. He will assist K. D. Nichols, AEC general manager, in programs concerned with reactor development, biology and medicine, research and industrial development. Mr. Tammaro's former post of manager of the Chicago operations office will be filled by John J. Flaherty.

Edward J. Bloch, director of division of construction and supply since 1951, was appointed director of the production division. John A. Derry is now construction and supply director.

## Appointments in Washington

Paul E. Gurske, chairman, Oregon State Industrial Accident Commission, has been appointed director, Bureau of Labor Standards.

Thomas P. Pike of Los Angeles has been named assistant secretary of Defense for supply and logistics.



After test run on dynamometer, engines move to chassis assembly line



## U.S. Sharpens Services to Labor Surplus Areas, Avoids Handouts

THE U. S. BELIEVES that "the Lord helps them who help themselves," at least when it comes to aiding areas with substantial labor surplus.

No financial handouts are going to the 34 major and 46 smaller localities plagued with serious unemployment. While Washington thinks that capital should be obtained through private channels, it can and does extend aid in other ways.

Just created is an Area Development Division in the Commerce department. It is the focal point and clearing house in the government for distressed areas seeking help.

"The primary mission of the Area Development Division is to work with state and local area development groups and to assist them in their efforts to help themselves," says James C. Worthy, assistant secretary of Commerce for administration.

### The Bag of Tricks . . .

What does the ADD have in its bag of tricks? One type of direct assistance is the policy of the Office of Defense Mobilization of allowing extra-liberal percentage of

fast amortization for plants within the expansion goals that are located in distressed areas. Unfortunately most of the defense expansion has been arranged so such help cannot be given on a large scale. However, some expansion goals still are open so that, considering that even one plant can help out a lot in a labor surplus community, there are distinct possibilities here. For example, Terre Haute, Ind., recently got such a plant and the economic condition of the city is improved greatly as a result.

A second type of direct assistance is provided by the policy of the armed services in setting aside some of its requirements for procurement from distressed area firms. But this help is not expected to be great because of the Maybank rider which prohibits granting a price differential to a firm in a labor surplus area. That means the firm in the distressed area has to meet the lowest price developed in competitive bidding.

The most valuable assistance, perhaps, is the tendering of information and advice about what new industries would fit the peculiar resources and advantages of the sick community, what new

products or processes would help build up backward existing industries and what industry in those communities could do to get more business from expanding markets.

The ADD works with other government agencies, like the Small Business Administration which has power to make loans and render procurement assistance to small business and which is giving special attention to distressed areas. It locates technical and other information — about new processes, new products and the like—with the help of the Patent Office, Office of Technical Services, Bureau of Standards, etc.

ADD has just completed a "Community Industrial Development Kit" containing valuable reports on the best approaches on the goal of getting more and larger payrolls in a community. It is working on a "New Products Assistance Kit," and a "Market Expansion Kit," both to be crammed with suggestive material under these heads.

### Refinements Coming . . .

The work of the new division has only begun. Ways and means of improving its scope and effectiveness are under study. For example, Lothair Teetor, assistant secretary of Commerce for domestic affairs, is asking business advisory committees of the Business & Defense Services Administration to study this problem of distressed areas. He tells them: "You are the jobmakers of America." Coming up soon are conferences in which solution of distressed area problems will be discussed by representatives of communities which have licked their own situations—so that the lessons thus learned can be employed by communities currently suffering labor surpluses.

The aid-to-distressed-areas program is under direction of assistant secretary of Commerce Teetor, and his deputy, Carl F. Oechsle. Director of the Area Development Division is Victor Roterus, a Commerce career official.

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TUBE MILLS

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# NEWS!

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- ✓ an extra strong weld—because it's 100% uniform and continuous.
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City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

# Future Brightens for Export Trade

The dollar gap is fast fading so foreign customers with ready cash should become easier to find. Foreign trade in 1953 shows continuing preference for U. S. metal goods

FOREIGN TRADE statistics for 1953 hold a ray of hope for U. S. metalworking companies wishing to expand their foreign markets.

U. S. exports hit an all-time dollar high in 1953—\$15.7 billion, up mainly to a hefty \$3.5 billion in military-aid shipments. But while agricultural exports declined 1 per cent from \$3.4 billion in 1952 to \$2.8 billion in 1953, non-agricultural exports (other than military-aid shipments) dipped by 3.5 per cent from \$9.6 billion in 1952 to \$9.3 billion in 1953.

**Plus Sales**—And among U. S. industries showing gains in 1953 exports were: Refrigerators and freezers, \$82 million in 1952, \$88 million in 1953; radios and television apparatus, \$71 million in 1952, \$102 million in 1953; metalworking machinery other than machine tools, \$132 million in 1952, \$13 million in 1953; tractors and parts, \$289 million in 1952, \$300 million in 1953; passenger cars, \$44 million in 1952, \$276 million in 1953; miscellaneous metal manufacturers, \$342 million in 1952, \$43 million in 1953.

These export gains were made in the face of record levels of industrial output and increased pressure to sell in most foreign countries, import restrictions on many U. S. goods and a limited availability of U. S. dollars in many countries.

**Gone Gap**—The dollar-gap in nonmilitary exports is more than closed, however, points out the American Tariff League. Nonmilitary U. S. exports were \$12.2 billion including foreign economic aid in 1953 and general imports were \$10.9 billion. But the Commerce department reports U. S. economic grant shipments for January to September, 1953, totaled \$3 billion, very nearly cancelling out the dollar gap on merchandise trade for the entire year of 1953. And foreign countries earned at least \$1 billion on U. S. government spending for military main-

tenance abroad and have other "invisibles" means of dollar income.

As foreign countries continue to build up their dollar credits, it should be easier for U. S. manufacturers to find foreign customers with dollars. Export experience of 1953 shows American-made metalworking products still enjoy a wide customer preference in world markets.

## Automotive Exports Climb

Motor vehicle exports for the first two months of 1954 were more than 10 per cent above exports for the same period of 1953, says the Automobile Manufacturers Association. New vehicles exported in January and February, 1954, totaled 67,497, with February's shipments equaling 6.7 per

cent of total output. That's the highest export percentage since March, 1952.

## ATL Analyzes Foreign Trade

The American Tariff League's analysis of U. S. foreign trade in 1953 brought out: 1. The ratio of U. S. customs collections to total dutiable imports fell from 12.8 per cent in 1952 to a new all-time low of 12.4 per cent last year. 2. The proportion of duty-free imports to total U. S. imports for consumption declined from 58.2 per cent in 1952 to 54.9 per cent in 1953.

## Britain O.K.'s Red Exports

Peter Thorneycroft, president of Britain's Board of Trade, has told the House of Commons that Britain is determined to do all in her power to attain maximum trade with Russia. The Board of Trade has already approved for export \$18.2 million out of \$35 million in firm orders recently brought home by British businessmen from Russia.



## Canadian 'Copter Maker Looks for U.S. Parts Producers

The Canamerican SG-VI, Canada's only commercially-approved helicopter, is being exhibited at the First International Machine Tool Exposition, Brooklyn, N. Y., for the benefit of parts manufacturers, licensees and commercial buyers. Canamerican expects to produce the aircraft in the U. S. and assemble it in Canada with Canadian fuselages. "We're using this unusual method of displaying the helicopter at the Brooklyn show in order to explore every production possibility," says V. H. Abrams, Canamerican vice president. Canamerican expects eventually to license production in other lands as well as Canada and U. S.

# Finished Steel: Where It Went in 1953

**Return to civilian economy boosts mill shipments to auto industry and increases distribution of light, flat-rolled products**

RETURN to a civilian economy is reflected in 1953 steel distribution figures compiled by the American Iron & Steel Institute.

The automotive industry received an increased proportion of the finished steel shipped from mills, and hot-rolled and cold-rolled sheets rose percentage-wise while hot-rolled and cold-finished bars declined slightly. The light, flat-rolled products, like sheets, go largely into civilian goods, while bars play a big part in war materiel.

**The Lion's Share**—In 1953, the automotive industry received 18.30 per cent of the finished steel shipped by mills, compared with 16.00 per cent in

1952 and 16.45 per cent in 1951. Both 1951 and 1952 were Korean war years. In the latter year, distribution was disrupted by a two-month strike of steel workers.

Indicative of the return to a civilian economy, mill shipments of hot-rolled and cold-rolled sheets comprised 23.7 per cent of the total finished steel moved from mills. The percentage in 1952 was 21. Hot-rolled and cold-finished bars accounted for 14.3 per cent of total mill shipments of finished steel in 1953 compared with 14.7 per cent in 1952.

**Big Three**—The automotive industry and war houses were the two largest customers of the steel mills in 1953. In third place was the construction industry. Those three were outlets for half of all the finished steel shipped by mills that year. The warehouses are distributors rather than consumer

## DISTRIBUTION OF FINISHED STEEL

Net tons of mill shipments of all grades, including alloy and stainless

Market Classification	Ingots, Blooms, Billets, Slabs, Sheet Bars, and Seamless Tube Rounds	Skelp	Wire Rods	Structural Shapes (heavy)	Steel Piling	Plates	Standard Rails (over 60 lb)	Rails (all other)	Joint Bars	Tie
Converters, Processors	967,152	26,377	263,538	408	.....	79,940	2,191	546	8,417	2
Forgings (except automotive)	871,929	.....	1,544	.....	.....	17,402	.....	.....	.....	.....
Bolts, Nuts, Rivets, Screws	26,425	.....	271,756	.....	.....	2,188	.....	.....	.....	.....
Jobbers, Dealers, Distributors	71,374	1,232	47,361	1,071,006	26,692	1,161,230	7,049	15,769	2,258	1
Construction, Maintenance	119,010	18	18,829	2,617,921	282,768	1,789,559	59,012	22,348	2,724	2
Contractors' Products	18,375	.....	39,292	17,125	.....	206,634	.....	.....	.....	.....
Automotive	368,102	.....	38,360	44,990	.....	447,778	.....	.....	.....	.....
Rail Transportation	25,245	.....	65	453,981	502	1,012,792	1,592,497	9,491	98,941	372
Shipbuilding, Marine Equipment	9,121	.....	89	134,867	2,004	576,585	527	326	3	.....
Aircraft	27,702	.....	53	2,617	.....	11,076	.....	.....	.....	.....
Oil and Gas Drilling	42,384	.....	.....	40,565	842	94,456	.....	.....	.....	.....
Mining, Quarrying, Lumbering	2,102	.....	1	33,303	7,935	74,236	44,428	22,865	2,027	2
Agricultural	13,814	.....	5,926	46,911	.....	101,714	.....	.....	.....	.....
Machinery, Industrial Equip., Tools	121,916	.....	71,738	251,258	.....	1,214,302	4,343	3,575	191	1
Electrical Machinery and Equipment	1,988	.....	14,719	38,141	.....	178,303	.....	.....	.....	.....
Appliances, Utensils, Cutlery	76	.....	1,095	3,205	.....	15,388	.....	.....	.....	.....
Other Domestic, Commercial Equipment	2,246	.....	15,201	3,792	.....	17,989	.....	.....	.....	.....
Containers	13,418	.....	932	3,150	.....	45,035	.....	.....	.....	.....
Ordnance and Other Military	757,141	.....	153	16,578	271	402,578	2,254	53	360	3
Export	51,363	85,770	8,935	241,434	21,880	206,274	154,245	8,276	5,768	35
Unclassified	32,858	.....	1,061	760	.....	12,815	.....	4,261	413	.....
<b>Total</b>	<b>3,543,741</b>	<b>113,397</b>	<b>800,648</b>	<b>5,022,012</b>	<b>342,894</b>	<b>7,668,274</b>	<b>1,866,546</b>	<b>87,510</b>	<b>121,102</b>	<b>429</b>

Market Classification	Mechanical Tubing	Pressure Tubing	Wire, Drawn	Nails and Staples	Wire, Barbed and Twisted	Woven Wire Fence	Bale Ties	Black Plate	Tin and Terne Plate (hot-dipped)	Tin (electrolytic)
Converters, Processors	11,234	5,277	814,141	565	644	674	.....	5,542	.....	.....
Forging (except automotive)	.....	3	317,849	.....	.....	.....	.....	.....	.....	.....
Bolts, Nuts, Rivets, Screws	.....	.....	292,074	471,324	122,389	233,359	35,895	71,510	48,673	75
Jobbers, Dealers, Distributors	229,529	104,869	58,115	22,002	5,328	7,813	377	7,701	2,525	4
Construction, Maintenance	32,076	42,506	69,589	836	.....	2	.....	19,725	2,345	2
Contractors' Products	37,300	17,056	.....	.....	.....	.....	.....	15,261	1,491	1
Automotive	209,009	10,140	322,423	410	.....	.....	.....	.....	.....	.....
Rail Transportation	4,773	3,717	3,125	3,998	1,120	1,758	.....	18	677	1
Shipbuilding, Marine Equipment	1,448	8,376	674	6	79	6	.....	.....	94	176
Aircraft	10,835	380	1,546	40	.....	.....	.....	4	183	1
Oil and Gas Drilling	17,659	2,384	274	33	.....	.....	.....	.....	.....	.....
Mining, Quarrying, Lumbering	1,851	391	1,123	295	2	102	.....	.....	.....	.....
Agricultural	29,168	214	12,471	305	241	76	.....	341	49	1
Machinery, Industrial Equip., Tools	205,564	80,101	246,594	3,885	.....	.....	.....	6,321	4,258	9
Electrical Machinery and Equipment	15,600	3,753	60,400	397	.....	.....	.....	8,048	1,895	1
Appliances, Utensils, Cutlery	11,950	10,077	47,421	336	.....	.....	.....	69,964	6,610	14
Other Domestic, Commercial Equipment	52,562	46	358,070	949	.....	.....	.....	99,953	9,087	9
Containers	3,353	.....	104,643	9,760	407	.....	1,658	410,022	895,393	3,033
Ordnance and Other Military	102,141	1,771	29,546	1,647	30,739	5	1	371	23,625	1
Export	9,236	13,711	36,567	2,550	2,852	1,469	14	34,014	321,092	182
Unclassified	104,192	135,903	50,099	9,597	.....	.....	.....	.....	.....	.....
<b>Total</b>	<b>1,089,480</b>	<b>440,675</b>	<b>2,826,744</b>	<b>528,935</b>	<b>163,801</b>	<b>245,264</b>	<b>37,945</b>	<b>748,889</b>	<b>1,318,080</b>	<b>3,342</b>

ing the automotive industry as the largest steel consumer.

Although 1953 was a record year for mill shipments of finished steel, not all market classifications took as much steel as they did in the strike year of 1952 when production was low. Classifications showing tonnage declines in 1953 from 1952 were: Shipbuilding and marine equipment, oil and gas drilling, agricultural, and export.

The 1953 record of finished steel shipments from mills is 80,151,893 net tons. Previous record was 92,8950 tons in 1951. Shipments in the strike year of 1952 were 68,003,612 tons. These figures include carbon, stainless and alloy steels.

Although demand for alloy steels softened last year, the total tonnage of finished alloy steel shipped from mills in 1953 rose over the 1951 figure. So did shipments of stainless steels. Biggest consumer of alloy and stainless steels was again the automotive industry.

## Where Alloy, Stainless Steel Went

(Mill Shipments in 1953)

	Alloy, other than stainless —net tons	Stainless —net tons
Converters, Processors	95,827	31,735
Forgings (except automotive)	591,516	13,735
Bolts, Nuts, Rivets, Screws	81,864	6,876
Jobbers, Dealers, Distributors	469,787	155,436
Construction, Maintenance	101,908	6,365
Contractors' Products	34,826	12,392
Automotive	1,997,907	127,993
Rail Transportation	182,680	6,340
Shipbuilding, Marine Equipment	61,584	3,160
Aircraft	78,404	32,092
Oil and Gas Drilling	165,715	1,982
Mining, Quarrying, Lumbering	23,977	526
Agricultural	40,071	457
Machinery, Industrial Equip., Tools	573,289	39,422
Electrical Machinery and Equipment	594,136	14,571
Appliances, Utensils, Cutlery	36,406	40,656
Other Domestic, Commercial Equipment	32,664	13,875
Containers	24,162	1,538
Ordnance and Other Military	318,839	10,191
Export	126,368	13,134
Unclassified	185,866	69,063
Total	5,817,796	601,708

## MARKET CLASSIFICATION DURING 1953

Table compiled by STEEL from American Iron & Steel Institute figures.

Tons	Bikes	Wheels	Axles	Bars, Hot-Rolled (and light shapes)	Bars, Concrete Reinforcing	Bars, Cold-Finished	Bars, Tool Steel	Standard Pipe	Oil Country Goods	Line Pipe	Market Classification	
											Converters, Processors	Forgings (except automotive)
6	1			231,805	4,494	3,220	324	19,706	11,767	17,713		
				548,002		5,173	787				Bolts, Nuts, Rivets, Screws	
				559,308		86,664	1,256				Jobbers, Dealers, Distributors	
5	6	68		1,502,026	690,222	598,598	19,848	1,980,616	1,442,591	808,454		Construction, Maintenance
2	3	6,468	1,498	651,128	946,906	17,059	132	173,274	18,700	2,271,875		Contractors' Products
				217,841	45,593	17,923	82	171,001		19,849		Automotive
				2,545,284		529,152	1,114	4,871		71		Rail Transportation
106	1	308,470	146,747	340,752	2,384	8,248	33	12,826		709		Aircraft
			64	66,887	977	3,655	31	15,822		7,229		Shipbuilding, Marine Equipment
				44,411		21,312	790	199		288		Oil and Gas Drilling
1	8	1,781	261	140,216	40	9,270	11	9,800	342,538	32,969		Mining, Quarrying, Lumbering
				76,191	2,258	6,011	709	4,550	5	8,520		Agricultural
				402,903	83	84,005	36	28,486		2,510		Containers
5	9,297	1,065		835,570		345,342	14,812	53,945		38,244		Machinery, Industrial Equip., Tools
		194	41	125,318		43,371	377	197,231		10,700		Electrical Machinery and Equipment
				16,164		42,562	154	9,996		150		Appliances, Utensils, Cutlery
				98,089	9	40,833	142	7,689		1,028		Other Domestic, Commercial Equipment
				13,131		211		5,291		1,129		Ordnance and Other Military
3	77			646,281		240,682	657	14,051		25,335		Export
4	7	5,825	4,598	102,799	73,477	13,052	129	92,466	173,925	160,729		Unclassified
				159,323	82,408	78,032	74,728		29,819	99,816		Total
1209	332,245	154,210	9,323,429	1,848,851	2,194,375	116,152	2,801,820	2,019,345	3,507,318			

Tons	Sheets, Cold-Rolled	Sheets, Galvanized	Sheets, Coated (all other)	Sheets, Enameling	Sheets and Strip, Electrical	Sheets, Strip, Hot-Rolled	Strip, Cold-Rolled	Net Total	Per Cent of Total	Market Classification	
										Converters, Processors	Forgings (except automotive)
4	564	110,930	29,488	1,894	851		336,454	105,686	3,513,976	4.38	
								2	1,444,839	1.80	
		295	4,575	292			5,192	14,803	1,341,606	1.67	
		1,181	1,363,691	845,796	26,901	3,740	14,658	183,178	133,126	14,878,859	18.56
		3,110	132,123	135,243	2,169	764	2	91,532	9,918,203	12.38	
		6,166	711,977	651,685	17,464	39,763	2,495	105,848	193,926	3,324,218	4.15
		2,730	5,681,217	48,477	135,391	2,815	11,342	805,183	701,609	14,663,775	18.30
		1,254	20,089	28,836	113	786	9,919	21,984	5,470	4,787,830	5.97
		200	10,998	9,870	1,369		163	2,409	423	872,209	1.09
		697	14,697	1,999	773	54	1,364	1,618	8,298	161,043	.20
		120	3,999	1,244			80	1,191	1,452	755,714	.94
		258	3,074	2,258	21		165	5,412	723	324,380	.41
		1,333	78,659	143,045	5,074	6	65	95,417	7,786	1,233,247	1.54
		3,903	154,929	27,865	5,605	325	4,630	130,841	108,071	4,328,604	5.40
		555	260,947	35,829	11,279	6,535	691,863	71,611	135,627	2,111,879	2.64
		1,699	1,088,194	105,541	23,364	162,590	22,439	23,668	180,896	2,045,749	2.55
		1,123	792,377	62,184	11,470	8,005	6,049	74,572	266,113	2,086,076	2.60
		1,441	540,270	51,057	1,087	146		196,912	117,737	6,051,214	7.55
		1,242	123,560	3,924	643	91	848	27,201	68,815	2,690,888	3.36
		1,272	178,063	104,764	9,329	2,467	54,014	41,239	25,576	2,679,731	3.34
				1,471				56,019	937,853		Export
											Unclassified
											Total

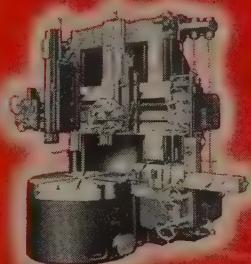
# Specify BULLARD MACHINE TOOLS

## MULT-AU-MATIC

Type "D" — 8"-12"-16" with 6 or 8 Spindles.  
Type "D" 16-23" and Type "K" 6 Spindles  
— and 6 Twin Spindles — 8 Spindles and 8 Twin Spindles.

## CUT MASTER V. T. L.

In six sizes 30"-36"-42"-54"-64" and 74".  
The 30" and 36" sizes have two heads  
while the 42"-54"-64" and 74"  
have three heads obtainable  
in various combinations.



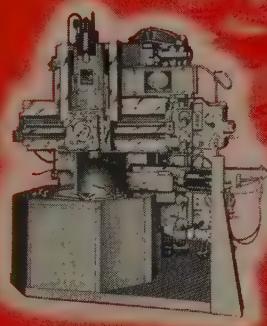
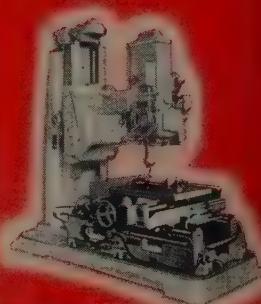
## CONTIN-U-MATIC

Type "KD" with 4-6 or 12 spindles.  
Sizes 10"-14"-20".



## SPACING TABLE

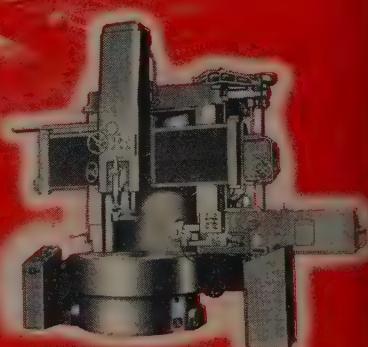
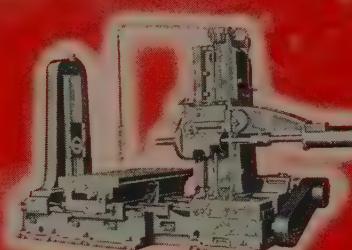
30 x 20 Spacing Table mounted on  
Super Service Drilling Machines  
or 4"-5" and 6" Radial Drills.



MAX-AU-TROL V. T. L.  
In six sizes 10" and 36" with two heads  
42"-54"-64" and 74" with three heads.

## HORIZONTAL BORING, MILLING AND DRILLING MACHINE

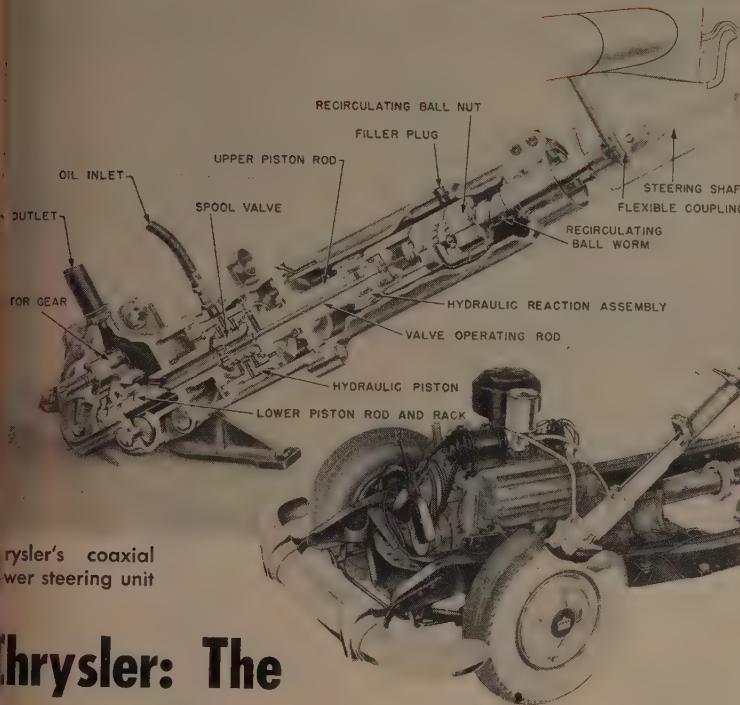
4" and 5" Spindle with various bed lengths and post heights.



## VERTICAL CHUCKING GRINDER

Six sizes, 30" to 74" are available  
with a variety of head combinations.

THE BULLARD COMPANY  
BRIDGEPORT 2, CONNECTICUT



Chrysler's coaxial power steering unit

## Chrysler: The Patient Prescribes for Himself

### DETROIT

RUDENTIAL Insurance Co. of America is noted for rocks on its stationery but not in its head. That's why those hanging crepe on Chrysler Corp. as its market share slipped in recent months were hit between the eyes with a \$250-million chunk of the Rock of Gibraltar, the Pru's almost stringless loan to Chrysler.

**Problems**—The mere fact that Rudential regards Chrysler as worthy of its rock pile is indicative of Chrysler's foundation not being in the sand either. But there is little doubt that Chrysler has some sand in its gears at the moment in the form of an organizational barrier to further growth and greater efficiency.

The origin of the situation goes back to the early days of Chrysler which grew by accretion rather than annexation. Even Dodge, the firm's largest division, was assimilated into the central staff setup rather than continuing as a

unit a la General Motors. Efficient at the time, this system began to burst at the seams as the corporation grew larger and for some years now the need for greater divisional authority has been felt.

**A Start Made**—Real start of the divisionalization program — which Chrysler regards as more positive sounding than "decentralization" — can be pegged at 1950 when energetic L. L. Colbert became president. Careful study of other corporate structures was undertaken, with the conclusion that Chrysler would have to develop its own structure to suit its special problems. Probable windup will lie between GM's somewhat laissez faire and Ford's less laissez organization. At present about 20 top Chrysler departmental men have been pulled into a full-time group determining the future organizational outlines.

Some steps have already been taken. As of the first of the year, all Chrysler divisions became

autonomous units profitwise. That means the central Chrysler accounting staff which formerly told the division how it was doing some months after the horse was stolen itself became divisionalized. Also each division will now sell products it manufactures for other divisions competitively with outside suppliers instead of transferring them as "standard cost" as before. That puts the efficiency burden on each division as buyer and seller and will give each division a picture of its profit and loss right down to the department level.

**Thinking Stage** — That, coupled with \$250 million jingling in its jeans, adds interest as Chrysler takes another look at its manufacturing setup in the divisionalized scheme of things. It's certain that changes will be made. Carl W. Snyder, vice president and operations manager, gives some indicative trends in Chrysler thinking.

Basic to efficiency, of course, is high volume. That means that wherever the same type of part is being made in different plants, consolidation will be considered to get volume up. Just as the Power-Flite transmission plant in Indianapolis now supplies all divisions its production and the Lynch Road plant supplies axles, other unit facilities are under consideration to supplant facilities splitting the volume presently. Other moves of the same type loom probable, not only to eliminate duplicative facilities, but for automation.

**Realism on Automation**—Chrysler does not have a pollyanna attitude toward automation, but it realizes that where you have a high volume of similar parts the probability of using automation and cutting costs is increased. Thus Plymouth and Dodge hoods, for example, can be designed to go down the same automated press line with only the dies being changed so that the amortization of the handling equipment between presses may be shared.

There are plenty of other parts of which similar planning can be effected to hike volume, but another technique for output boost-

ing is integration of manufacturing. An example is the new Chrysler full-time coaxial power steering. Announced this week (see photos), the unit will replace Chrysler's currently offered Gemmer integral unit. Being manufactured in Chrysler's Trenton, Mich., plant which also manufactures 6-cylinder Dodge and DeSoto engines, it's a good example of a unit which has grown to sufficient volume to become profitable. Conceivably when production gets rolling, the same unit could be adapted to Dodge and Plymouth cars as well as DeSotos and Chryslers to extend volume further.

**Modernization, Too**—Other examples of integration include the move to pull large stampings now being made by Budd Co. into the Nine Mile press plant and of course the recent purchase of Briggs Mfg. Co. which builds Plymouth bodies. Briggs, incidentally, is a good example of another area of manufacturing scrutiny—modernizing existing facilities.

Currently under way is a project to dig tunnels under every press line in the Briggs plant to put in a scrap conveyor system. In addition, presses lined up side by side in the plant must be turned back to front to permit in and out automatic handling. That means new pits must be dug and the project is beginning with the major presses first. It will probably be three years before the effort yields a modern, highly automated press plant.

**What About Suppliers?**—How will the Chrysler program affect suppliers? If you're a vendor of industrial equipment, you'll probably have an opportunity to bid for some of that \$250 million as Chrysler revamps its manufacturing operations. If you're a vendor of automotive parts, it might well be wise to re-examine your own manufacturing facilities to be sure you're modern and competitive. Carl Snyder emphasizes that manufacturing integration need bring no fears to the outside supplier who is up to date.

Looking further down the road with Chrysler Corp. it appears probable that before long a parts supplier division will take its place in the new corporate structure.

## Auto, Truck Output

U. S. and Canada

	1954	1953
January	594,789	614,000
February	573,801	628,017
March	672,485	752,149
April		782,453
May		685,390
June		713,206
July		757,595
August		641,152
September		605,228
October		651,153
November		457,852
December		529,588
Total	7,817,783	
Week Ended	1954	1953
Mar. 13	143,478	165,762
Mar. 20	154,895	169,923
Mar. 27	149,562	181,749
Apr. 3	146,498	170,567
Apr. 10	152,262	176,783
Apr. 17	150,000*	162,171

Source: Ward's Automotive Reports.

\*Estimated by STEEL.

But whatever course the divisionalization may take, to Prudential and to Chrysler, divisionalization is a new way to "Divide and Conquer."

## Car of the Week

Buick might well pick out a slogan like—"If you live to be a hundred it'll be a Century." Certainly the car was an appropriate choice for the trip from Detroit to Daytona Beach for Speed Week.

On the trip to Daytona Beach

it was no problem to average 90 mph over-all including stops for dinner and gas, for in a Century you don't stay behind anything but police cars.

Just for the heck of it we put the Century through the traps on the beach and with the speedometer hovering at 115 mph turned in a private average of 101.86 mph. That was running with 18 pounds of air in the tires and without touching the engine which had less than 2000 miles on it at that point. The Century, suffice it to say, is a goin' machine, and one entered in the event turned 110 mph.

Perhaps the biggest surprise in the Century was the improved handling over the Roadmaster we drove last year. Ride is still unmistakably Buick with that bubble-gum cushion sensation, but a corner this car also holds like bubble gum. Roll has been considerably reduced and the braking was noticeably good. This is one bomb that won't go off in your face.

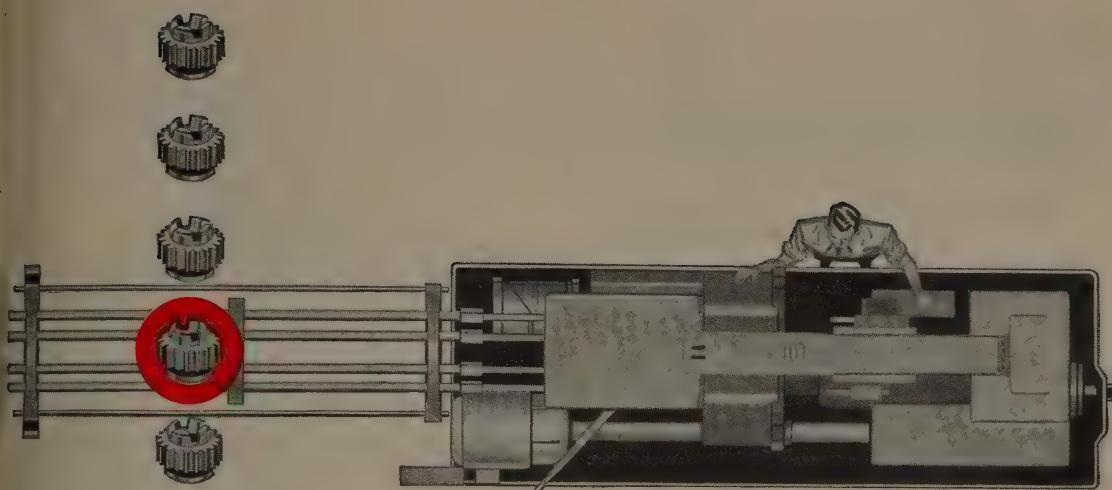
The interior definitely left something to be desired, both in design and in workmanship. Particular glaring was a jagged point at the end of the dashboard sweep-back and the upholstery looked much like seat covers in fit and appearance. It was a long reach to the radio on the recessed dash and the glove compartment was not only extremely shallow but a long, long reach for the driver.

Oh, yes—the windshield didn't crack.



## Hudson Brings Out New, Lower-priced Jet

Newest addition to Hudson's line is the two-door Jet Family Club Sedan priced \$200 under the previous lowest-priced Hudson. The car has ample room for six despite its compact size, the company says. The new Jet has Hudson's step-down design and Monobilt construction. Dual Range Hydra-Matic drive is optional.



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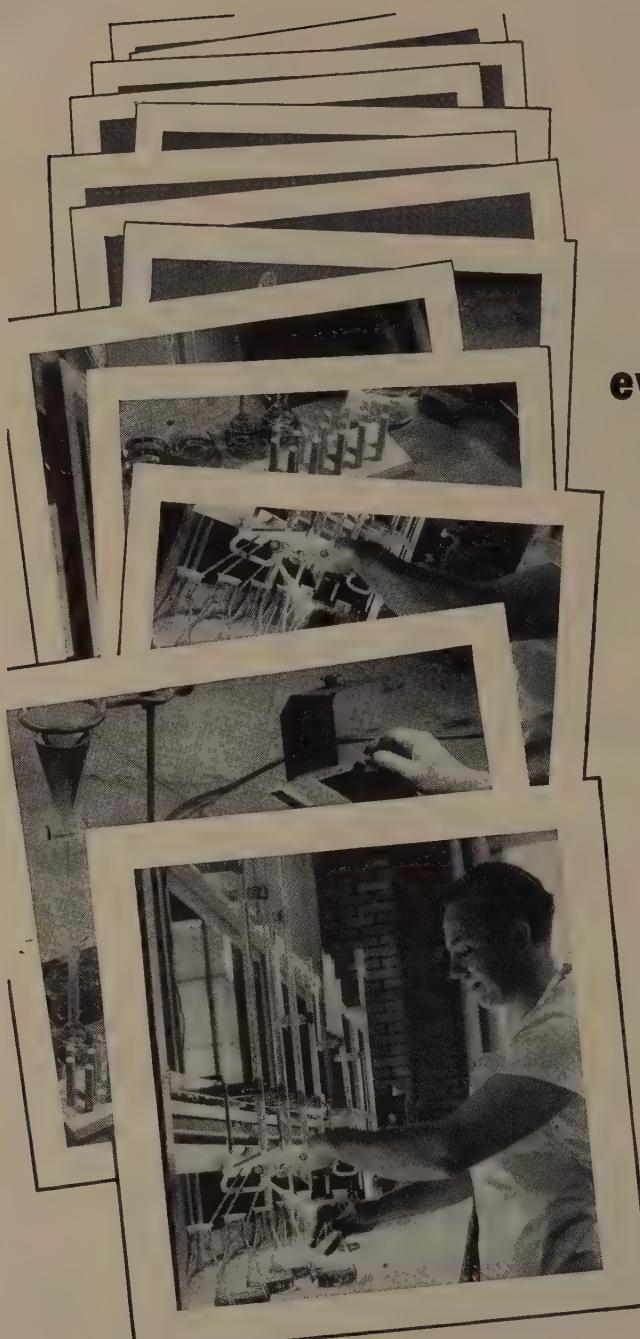


Warren Steel Division

**THE COPPERWELD STEEL COMPANY**

Warren, Ohio

For Export—Copperweld Steel International Company  
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**60**

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stainless steel forging  
bars uniform**

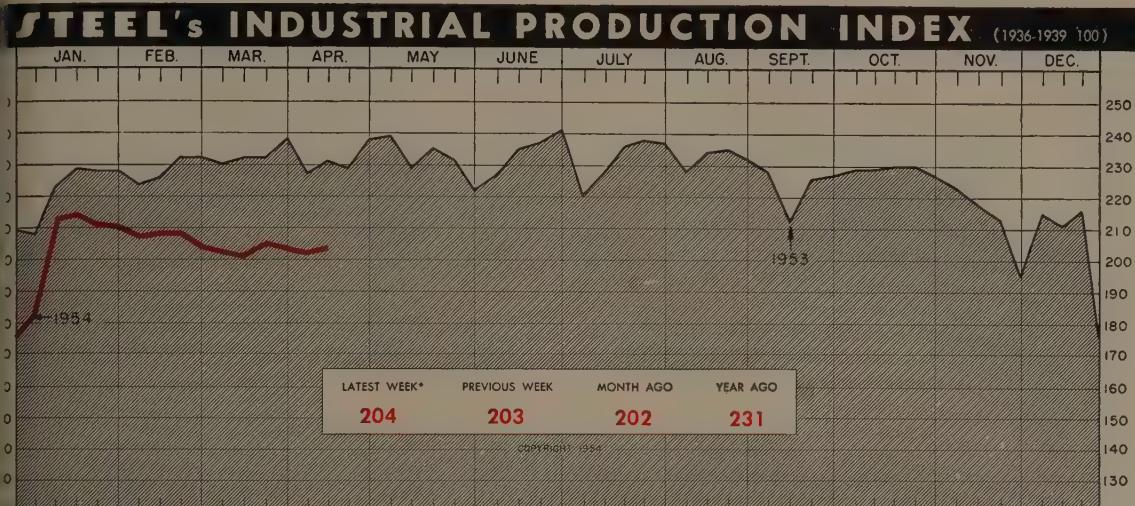
WE SUBJECT every heat of stainless steel to 60 separate checks for chemical composition. These tests tell us when the analysis is *right*. This is one reason why, with Timken® stainless steel forging bars, you get uniform physical and chemical properties, uniform forgeability, uniform response to heat treatment. As a result, you don't have to change your shop practices with every shipment of material. You save production time, cut scrap loss, get a top-quality finished product.

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YEARS AHEAD — THROUGH EXPERIENCE AND RESEARCH



**SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING**



Week ended Apr. 10

Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.

## Seasonal Forces Should Spark a Production Upturn

Business shows signs of improvement. This doesn't necessarily mean the economic adjustment is over. Rather, it appears that seasonal forces are lifting business from its current level.

Manufacturers are optimistic. A spot check of 157 companies by the National Industrial Conference Board reveals that four out of ten expect their production in this quarter to exceed first-quarter levels. Contrariwise, only half that number predicts a further decline. Seasonal forces already have tended to stabilize production. STEEL's industrial production index in March averaged 204 per cent of the 1936-1939 average. During the second week of April, STEEL's index rose 1 point from the preceding week and registered 204 per cent also.

### Generating an Upturn...

Signs of greater strength are being shown by the components of STEEL's index. Electricity output, generally, has been increasing its over-the-year gains in the last five weeks. During the week ended Feb. 7, electricity output was down by a gain of only 4 per cent above

the comparable week in 1953. During the latest week the over-the-year gain had risen to 5.5 per cent, according to the Edison Electric Institute.

### Support for the Upturn...

Rise in the over-the-year gains in electric output during four of the last five weeks has been aided, generally, by the increased use of electricity in the central industrial district. In the week ended Mar. 6, this section was using 3.4 per cent less electricity than in the comparable week of last year. In the week ended Apr. 3, the over-the-year decrease had been reduced to 1.8 per cent.

### More Freight Coming?...

The bright spot in railroad freight carloadings is miscellaneous freight, a category which largely includes manufactured goods. During the week ended Apr. 3, the gain in miscellaneous carloadings from the preceding week was greater than seasonal. With a continuance of this impetus, other categories should commence to rise and total carloadings could

ascend from the doldrums once again.

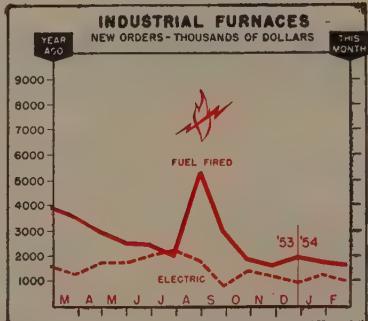
### Driving Power...

Things are also looking up for the automobile industry. Of special significance is the over-the-year gain in exports during the first two months of the year. In January and February, exports amounted to 6.7 per cent of total output, 10 per cent more than in the comparable period last year.

### Auto Sales Have Improved...

New car dealers wax enthusiastic over their used car sales in March. During the month used cars moved at the best pace since last July, says Ward's *Automotive Reports*. Accordingly, used car inventories fell 7 per cent below the all-time high established last Nov. 30 to the lowest point since last September. For the first time since last August, used car inventories in the hands of new car dealers are below a month's supply.

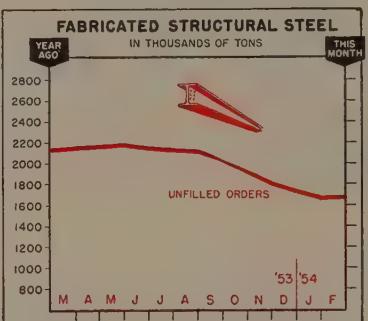
Meanwhile, domestic new car sales in March totaled 493,000 units, 23 per cent more than in February and 5 per cent below



Industrial Furnaces  
New Orders—Thousands of Dollars

	Fuel Fired*	Electric	1954	1953
Jan.	3,540	1,374	1,655	
Feb.	3,996	1,093	1,721	
Mar.	3,607	1,301	1,301	
Apr.	2,609	1,796	1,796	
May	2,550	2,095	2,095	
June	2,017	2,246	2,246	
July	5,465	1,904	1,904	
Aug.	3,019	873	873	
Sept.	1,975	1,539	1,539	
Oct.	1,692	1,256	1,256	
Nov.	2,013	1,014	1,014	
Dec.	1,014			

\*Except for hot rolling steel.  
Industrial Furnace Mfrs. Assn.

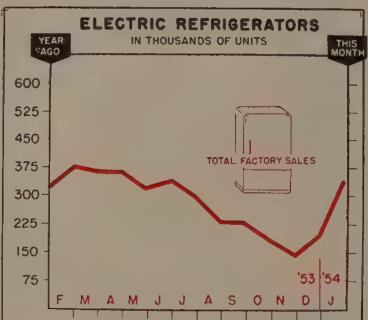


Fabricated Structural Steel

Thousands of Net Tons

	Shipments	Backlogs	1954	1953
Jan.	242.4	241.4	1,686	2,180
Feb.	252.0	251.1	1,697	2,128
Mar.	266.3	266.3	2,155	
Apr.	263.2	263.2	2,168	
May	263.8	263.8	2,179	
June	274.6	274.6	2,153	
July	230.3	230.3	2,134	
Aug.	251.1	251.1	2,122	
Sept.	255.6	255.6	2,041	
Oct.	295.5	295.5	1,927	
Nov.	257.8	257.8	1,804	
Dec.	266.9	266.9	1,741	
Total	3,117.6			

American Institute of Steel Construction.

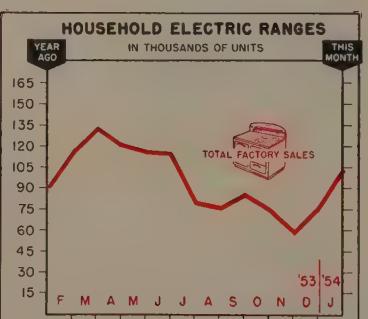


Electric Refrigerators

Total Factory Sales—Units

	1954	1953	1952
Jan.	344,101	325,186	260,259
Feb.	377,605	329,838	
Mar.	368,498	276,972	
Apr.	366,951	225,994	
May	317,667	217,017	
June	343,114	324,885	
July	289,838	233,877	
Aug.	232,981	250,224	
Sept.	231,224	230,111	
Oct.	179,749	207,065	
Nov.	139,563	256,530	
Dec.	137,102	248,506	
Total	3,378,478	3,091,434	

National Electrical Mfrs. Assn.



## BAROMETERS OF BUSINESS

### INDUSTRY

	LATEST PERIOD	PRIOR WEEK	YEAR AGO
Steel Ingots Production (1000 net tons) <sup>2</sup>	1,626	1,648	2,230
Electric Power Distributed (million kwhr)	8,396	8,463	8,001
Bitum. Coal Output (daily av.—1000 tons)	987	1,112	1,189
Petroleum Production (daily av.—1000 bbls)	6,450 <sup>1</sup>	6,486	6,268
Construction Volume (ENR—millions)	\$314.3	\$329.5	\$342.0
Automobile, Truck Output (Ward's—units)	152,262	146,498	176,783

### TRADE

Freight Car Loadings (unit—1000 cars)	605 <sup>1</sup>	599	721
Business Failures (Dun & Bradstreet, no.)	246	267	140
Currency in Circulation (millions) <sup>3</sup>	\$29,795	\$29,701	\$29,780
Dept. Store Sales (changes from year ago) <sup>3</sup>	-13%	-11%	+8%

### FINANCE

Bank Clearings (Dun & Bradstreet, millions)	\$18,703	\$17,894	\$15,708
Federal Gross Debt (billions)	\$270.3	\$274.9	\$264.5
Bond Volume, NYSE (millions)	\$17.2	\$15.7	\$20.9
Stocks Sales, NYSE (thousands of shares)	10,330	10,785	10,278
Loans and Investments (billions) <sup>4</sup>	\$78.1	\$79.2	\$76.8
U. S. Govt Obligations Held (billions) <sup>4</sup>	\$30.9	\$31.6	\$29.5

### PRICES

STEEL's Finished Steel Price Index <sup>5</sup>	189.74	189.74	181.31
STEEL's Nonferrous Metal Price Index <sup>6</sup>	211.9	212.5	229.3
All Commodities <sup>7</sup>	110.9	110.9	109.4
Commodities Other Than Farm & Foods <sup>7</sup>	114.6	114.4	113.2

<sup>1</sup>Dates on request. <sup>2</sup>Preliminary. <sup>3</sup>Weekly capacities, net tons: 1954, 2,384,549; 1953, 2,254,459. <sup>4</sup>Federal Reserve Board. <sup>5</sup>Member banks, Federal Reserve System. <sup>6</sup>1935-1939=100. <sup>7</sup>1936-1939=100. <sup>8</sup>Bureau of Labor Statistics Index, 1947-1949=100.

profits, of course, suffer during the process.

### Separate Entities . . .

In the prelude to its survey of business conditions the National Industrial Conference Board notes that the extent and severity of the current decline varies widely from industry to industry and even among producers in the same industry. Current statements and reports, even from concerns in the same industry, reveal the same fact. Thus in the latest fiscal quarter or month one company says that sales are above the year ago period, while another states that it is cutting employment or taking an extended inventory. A third concern may report reduced sales but increased earnings. So it goes in this period of ever-increasing competition.

### Volume Economics . . .

Greater competition has also focused the spotlight more sharply on earnings per dollar of sales. These earnings have been declining for at least several years. They declined last year, generally, but the high volume of sales kept total earnings up. Now the high volume is diminishing and competition is

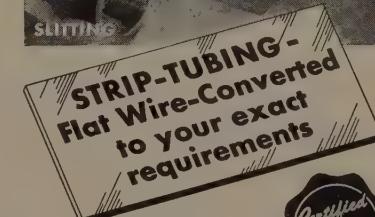
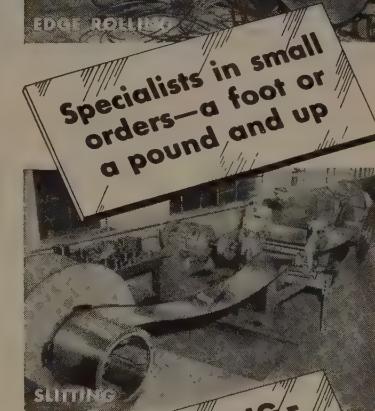
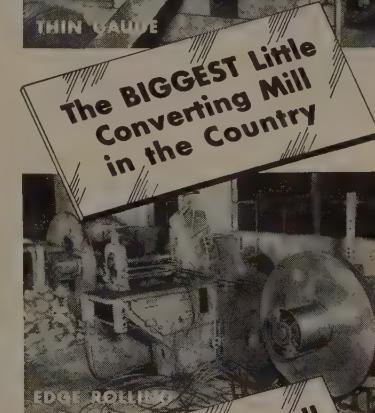
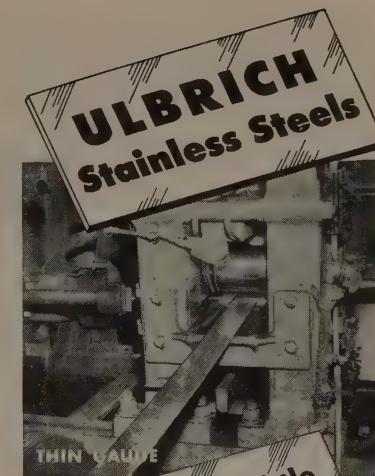
forcing a continuation of the same trend. Net result is a cut in profits for many concerns. For others it means going out of business before disaster takes over. Thus the National Automobile Dealers Association reports that 587 new car dealers went out of business during the first quarter, 205 more than in the comparable period of last year.

### Business Prepares . . .

The business decline and the tendency to put one's house in the best order possible is also responsible for the sharp fall in loans to business. From the first of the year to Apr. 7, business loans made by major New York City banks have fallen \$404 million.

### Consumer Prepares Also . . .

The American consumer has also retrenched even though it appears that he could easily spend more. That opinion of Arno J. Thompson, vice president and economist of the J. Walter Thompson Co., is backed up by figures which show that personal income after taxes during the first quarter was at an annual rate of \$250.5 billion, \$5.9 billion more than the like quarter last year.



Complete Inventory—  
Delivery from Stock



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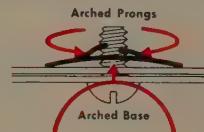
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Another outstanding SPEED NUT example of profit-saving through cost-reduction! Federal Malleable Co., a newcomer in the heater field, selected SPEED NUT Brand Fasteners after carefully checking various attaching methods. The results over all other types considered was a 50% SPEED NUT assembly savings! Here are a few of the reasons: SPEED NUTS reduce material and handling costs, often saving as many as 4 parts per attachment: no special application skills are required; these spring steel fasteners snap in place by hand, are self-retaining in blind locations; costly welding, clinching or staking equipment is eliminated!

Six standard SPEED NUT types, 17 parts in all, solved Federal's problem: Flat type, Push-Ons, "J" & "U" types, Tubular Clips, and Tube Clamps. Contact your Tinnerman representative for detailed cost-saving information on your products.

### The SPEED NUT Principle of Spring Tension Fastening

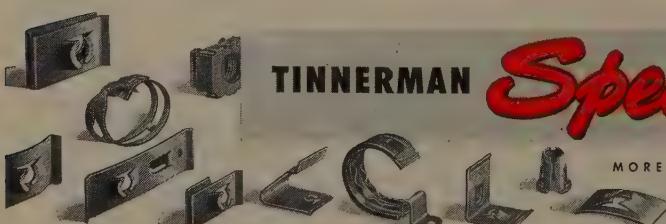


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**ALEXANDER H. d'ARCAMBAL**  
... Niles-Bement-Pond president



**J. M. BRASHEAR**  
... Lone Star Steel gen. supt.



**ROBERT E. HARVEY**  
... to direct Newport Steel operations

Alexander H. d'Arcambal was elected president of Niles-Bement-Pond Co., West Hartford, Conn. He succeeds Charles W. Deeds, elected chairman of the board. Richard V. Banfield was named to the newly created position of executive vice president. Mr. d'Arcambal has been acting general manager since the death of Frederick U. onard on Mar. 14.

Wilmer H. Churchill and Arvid H. Corneliusen were elected vice presidents of United-Carr Fastener Corp., Cambridge, Mass. They continue in their respective positions of chief product engineer and sales manager.

Edward A. Livingstone, vice president, Babcock & Wilcox Co., New York, was elected to the board of directors. He also was placed in charge of the company's tubular products division. He assumes the position vacated by Luke E. Sawyer, who became a consultant to the company handling assignments in the tubular products division.

Wodd W. Fredericks was appointed Detroit district manager of the original equipment division of Aluminum Industries Inc., Cincinnati. He has served for 20 years as representative of the automotive division of Bohn Aluminum & Brass Corp., Detroit.

Promotions at Lone Star Steel Co., Lone Star, Tex., include: J. M. Brashear, former open-hearth furnace superintendent, made general superintendent; L. G. Graper, vice president-research and development, named to assume duties formerly held by W. R. Bond, vice president-operations, who has resigned; A. J. Malone, made assistant general superintendent, steel division; Glenn Anderson, assistant general superintendent, coke-iron-ore division; Steve Purcell, superintendent, open-hearth furnace department; and McCready Young, superintendent, production planning department.

Bliss & Laughlin Inc. appointed Harry M. Clarke manager of a newly formed department of commercial research which has headquarters in the company's general offices at Harvey, Ill.

Robert S. Grover was elected executive vice president, Apex Steel Corp., Los Angeles.

Helmer Peterson was named plant superintendent of A. P. Smith Mfg. Co., East Orange, N. J.

Albert H. Barrett was made director of purchases for Taylor Instrument Cos., Rochester, N. Y. Formerly production manager, he succeeds Curtis D. Hart, retired. John B. Ireland succeeds Mr. Barrett.

Robert E. Harvey was elected executive vice president and general manager of Newport Steel Corp., Newport, Ky., subsidiary of Merritt-Chapman & Scott Corp. He most recently served as vice president and comptroller of Capital Transit Co., Washington. Rolland O. Baum, vice president of Merritt-Chapman & Scott in charge of procurement, subcontracts and insurance, was made a Newport Steel vice president, and D. M. Pope was appointed comptroller.

Pittsburgh Steel Co. appointed Robert A. Crawford superintendent of its hot sheet mill at Allentown, Pa. Anthony Thomas was made head roller.

Seymour Weinstein was made technical director of Niagara Filters Division, American Machine & Metals Inc., East Moline, Ill. He formerly was in Chicago as central district sales manager. J. Walter Bird takes over in that area.

Wheeling Corrugating Co., Wheeling, W. Va., appointed J. A. Lane assistant to the vice president and A. F. Stewart manager of market research and sales analysis division.

T. V. Learson, general sales manager, International Business Machines Corp., New York, was made director-electronic data processing machines. He will co-ordinate en-



GEORGE BACKMAN



HARRY LANGE

... appointments at Waterbury Farrel Foundry & Machine

engineering, manufacturing and sales activity.

**Waterbury Farrel Foundry & Machine Co.**, Waterbury, Conn., appointed **George Backman** manager and chief engineer of its rolling mill and mill machinery division to succeed **Irving H. Tolles**, retired from the position of manager. **Harry Lange** was promoted from assistant chief engineer to chief engineer in charge of the bolt, nut, screw and rivet machinery division, a position formerly held by **Joseph M. Schaeffer**, recently elevated to company president.

**Chalmers B. Coleman** was named plant superintendent of **Melco Wire Products**, Los Angeles.

**Harry M. Heckathorn**, vice president, was elected president of **Mullins Mfg. Corp.**, Salem, O. He succeeds **George E. Whitlock** who was named to fill a newly created position of vice chairman. **Harry Krohne** was elected vice president, continuing as controller and secretary. **Frank W. Knecht Jr.** was made vice president of administrative planning and assistant secretary. **Harold O. Smith**, general manager of operations, was named vice president in charge of operations to succeed **Frank M. Beaubregard**, who will serve as special consultant to the president. **C. D. Alderman**, vice president in charge of merchandising, becomes vice president in charge of sales and

**Charles A. Morrow**, a vice president, becomes a special consultant to the president and vice chairman.

**Pfaudler Co.**, Rochester, N. Y., placed **Sidney W. McCann** in charge of manufacturing activities as manager of the Rochester division. **Howard W. Zoller** becomes factory manager and **A. V. Osborne** chief engineer.

At **Chrysler Corp.**'s jet engine plant near Utica, Mich., **W. W. Beadle** was appointed superintendent of production and **E. J. Weiss** plant engineer. Mr. Beadle has been serving as superintendent of

assembly at the plant and **M. Weiss** has been assistant plant engineer.

**Clearing Machine Corp.** transferred **Geroge Herrick** from its Lansing, Mich., to the Detroit sales office.

**Thomas J. Gerwig** was appointed an assistant district sales manager in **Republic Steel Corp.**'s Chicago district. He is succeeded as district sales manager, Philadelphia, by **Theodore M. Goeckner**.

**Norman F. Gebauer**, field sales man in St. Louis, was appointed director of a newly formed industrial sales district, industrial division, **Keystone Steel & Wire Co.**, Peoria, Ill.

**Earl F. Warner** was appointed works manager of the El Segundo, Calif., plant of **Nash Motors Division**, Nash-Kelvinator Corp. Former works manager, **Campbell Wood**, is relinquishing the post to take a leave of absence.

**Ralph M. Lehman** was appointed assistant sales manager, **Ros Gear & Tool Co.**, Lafayette, Ind.

**Carroll N. Lowe** was elected vice president-sales and a director of **Sargent & Greenleaf Inc.**, Rochester, N. Y.

**J. G. Gerrard** succeeds **R. H. Herner**, resigned, as supervisor, commercial products service, transmissions operations at the **Allison Di**



W. W. BEADLE



E. J. WEISS

... appointments at Chrysler's jet engine plant

## TYPICAL EXAMPLES OF FAWICK APPLICATIONS ON MODERN PROCESSING MACHINES



STAMCO Coil Box, coil opener, and feeding unit equipped with FAWICK Type CB Airflex Clutch with ventilating adapter.

Fawick Type CB  
Airflex Clutch

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trol, low maintenance, and long, adjustment-free service life.

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INDUSTRIAL CLUTCHES AND BRAKES



EDWIN C. McCLEARY

... Willys-Motors v. p.-manufacturing



M. W. ZOLTON

... joins York-Gillespie Mfg.



A. A. ARCHIBALD

... v. p.-special products at J&L

vision of General Motors Corp., Indianapolis.

**Edwin C. McCleary** was appointed vice president in charge of manufacturing for **Willys Motors Inc.**, Toledo, O. He will direct all phases of manufacturing at the Toledo main plant and at the Maywood, Calif., assembly plant. Mr. McCleary joined Willys in 1948 as production manager and has recently served as assistant to the executive vice president.

**New Plastic Corp.**, Los Angeles, elected **J. Allen Carmien** president, **W. C. Fortier** vice president-treasurer. Mr. Carmien, formerly executive vice president, acquired controlling stock interests and will direct company policy in the future. **Fred S. Jahn** resigned as president.

**Julian C. Pease**, vice president, was made executive vice president, **New Britain Machine Co.**, New Britain, Conn. He continues as general manager of the New Britain-Gridley Machine Division.

**A. E. Nussbaum** was made engineering consultant by the rolling mill division of **Stanat Mfg. Co.**, Long Island City, N. Y.

**M. W. Zolton** was appointed general manager in charge of the manufacturing and engineering facilities of **York-Gillespie Mfg. Co.**, Pittsburgh. With 18 years' experience in production and management in heavy industry, Mr. Zolton leaves Barium Steel Co. where he served as manager of its special products division at Pelham, N. Y.

**Barium Steel Corp.**, New York, announces changes in executive positions at its subsidiaries, **Phoenix Iron & Steel Co.** and **Phoenix Bridge Co.** **Harold B. Freeman Jr.**, formerly director of purchases of Phoenix Iron & Steel, was elected a vice president. **William A. Cook** was elected treasurer of both companies in addition to his present responsibility as vice president of both. In addition Mr. Cook is vice president of **Central Iron & Steel Co.**, another affiliate of Barium. **Marshall L. Barnhardt** was made secretary, **Phoenix Bridge Co.**, **J. C. Coutant** secretary, **Phoenix Iron & Steel Co.**

**Raymond I. Bond** was appointed chief buyer at **Veeder-Root Inc.**, Hartford, Conn.

## OBITUARIES...

**Joseph F. Knipper**, 54, co-operator of **Joseph G. Knipper & Sons**, Rochester, N. Y., died Mar. 30.

**Henry Duckworth**, 82, retired vice

president of **Norton Co.**, Worcester, Mass., died Apr. 1 in Florida.

**Ralph G. Sweeney**, 55, president and general manager, **Allyne-Ryan Foundry Co.**, Cleveland, died Apr. 12.

**A. A. Archibald** was elected vice president - special products and services of **Jones & Laughlin Steel Corp.**, Pittsburgh. This responsibility includes direction of the wire rope division, warehouse division, electricweld tube division and container division. **H. S. Geneen** was elected vice president-controller.

**W. Curtis Miller** and **Leland E. Coulter** were elected vice presidents of **Allied Products Corp.**, Detroit. Mr. Miller, former general manager of Plant 4 at Hillsdale, Mich., assumes management of Plant 3, also of Hillsdale. This change results from resignation of **Walter S. Smith** who had been in charge of Plant 3 for several years. **John Gergel** replaces Mr. Miller at Plant 4. Mr. Coulter directs RB and Hercules interchangeable punch and die activities.

**James D. Willson**, formerly as assistant treasurer of **Brown Co.**, Berlin, N. H., was elected treasurer of **Affiliated Gas Equipment Inc.**, Cleveland. **John A. Wilson**, assistant secretary, was promoted to secretary. **Philip W. Scott** resigned as secretary, treasurer and vice president of the company.

**C. C. Bigelow**, 56, president, **City Auto Stamping Co.** and **City Machine & Tool Co.**, Toledo, O., died Mar. 31.

**Harry Ingraham**, president, **Holden Co.**, Cleveland, died Apr. 3.

# V.I.P.

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You won't find it described in the books on metallurgy. But it's a mighty important factor here at Claymont in supplying you with carbon and alloy steel plates that are tailored to your specialized requirements.

To us it means *Very Important Plates*. It means individualized supervision of your order . . . particular attention to every detail of analysis, processing and inspection—right down the line from top to bottom.

Let us know your requirements—large or small. Our location in the heart of the Delaware Valley gives us complete access to convenient rail, water and highway transportation . . . enables us to efficiently and economically serve your needs.



## *Claymont Steel Products*

PRODUCTS OF WICKWIRE SPENCER STEEL DIVISION • THE COLORADO FUEL AND IRON CORPORATION

83

PHOENIX • ALBUQUERQUE • AMARILLO • ATLANTA • BOISE • BOSTON • BUFFALO • BUTTE • CASPER • CHICAGO • DENVER • DETROIT • EL PASO • FT. WORTH • IUSTON • LINCOLN • LOS ANGELES • NEW ORLEANS • NEW YORK • OAKLAND • ODESSA • OKLAHOMA CITY • PHILADELPHIA • PHOENIX • PORTLAND • PUEBLO • SAN FRANCISCO • SEATTLE • SPOKANE • TULSA • WICHITA • Canadian Agency Offices At • EDMONTON • TORONTO • VANCOUVER • WINNIPEG

### **OTHER CLAYMONT PRODUCTS**

**Flanged and Dished Heads • Manhole Fittings and Covers  
Stainless Clad Plates • Large Diameter Welded Steel Pipe**



**...AND LET'S GET SOME**

**NATIONAL**  
TRADE-MARK

**CARBON BRICK**

**AND SHAPES FOR**

**MAINTENANCE, TOO!"**

WHEREVER HOT METAL HITS, refractories take a beating. This is true *around* a blast furnace, as well as *in* it. That's why more and more operators are applying the lessons learned in *lining* blast furnaces to maintenance of *other* hot metal areas.

KEEP THESE  
STANDARD SIZES  
ON HAND  
FOR EMERGENCY!

13½" x 6" x 3" series

9" x 6" x 3" series

9" x 4½" x 2½" series



Write for  
Catalog Section S-6210

EXPERIENCE HAS PROVED the contributions of "National" carbon and graphite to better production, longer life and lowest maintenance-cost-per-ton in these and other applications:

- RUNOUT TROUGH
- CINDER NOTCH LINERS
- CINDER NOTCH PLUGS
- MOLD PLUGS
- BEDS AND TRAYS

- SPLASH PLATES
- STOOL INSERTS
- CORES
- SKIMMER PLATES

*The term "National" is a registered trade-mark  
of Union Carbide and Carbon Corporation*

**NATIONAL CARBON COMPANY**

A Division of Union Carbide and Carbon Corporation

30 East 42nd Street, New York 17, New York

District Sales Offices: Atlanta, Chicago, Dallas, Kansas City,  
New York, Pittsburgh, San Francisco

IN CANADA: Union Carbide Canada Limited, Toronto

# Foundry Buys Equipment

## Continental Foundry & Machine Co. boosts capacity for producing industrial machinery

INSTALLATION of about \$3 million worth of machine tools has been completed by Continental Foundry & Machine Co., East Chicago, Ind. The new facilities in the firm's plants in that city and in Wheeling, W. Va., will provide the company with a much greater capacity for the manufacture of rolling mill equipment and other heavy industrial machinery. Continental Foundry also operates plants at Erie and Coraopolis, Pa. Among the new installations at the East Chicago plant are a 100-ton crane and an 84-in. draw cut shaper. A duplicate of the shaper was installed at the Wheeling plant. Other new machine shop equipment installed at the two plants includes slotting machines, horizontal bars, latest types of profiling lathes and several kinds of auxiliary machinery and equipment.

## British Firm Goes to Canada

Vicom & Co. Ltd., a British firm specializing in radio, radar and electrical equipment for aircraft, will establish a plant in Langston, Ont., through a subsidiary, Vicom & Co. (Canada) Ltd. The firm has leased a 10-acre site and four buildings in Langston to make subassemblies for other Canadian manufacturers.

## Army Tests Dozer Attachments

Army tests are being conducted at Ft. Belvoir, Va., with attachments which are interchangeable among the three most common bulldozers used by the armed forces.

Experience during World War II and the Korean conflict indicated that damaged parts on dozers sidelined many for long periods of time because replacement parts weren't available. However, if the parts had been interchangeable from one dozer to another, many vehicles could have been kept active.

Models of Allis-Chalmers, Caterpillar and International tractors have been modified in rear power

take-off and mounting facilities and are being tested with various attachments.

## Will Build Warehouse

Eastern Brace-Mueller-Huntley Inc., steel distributor, will have a new warehouse in West Albany, N. Y. A 28,000-sq-ft structure will be built this spring for lease to the firm and completion is scheduled for May. The company now has offices at 143 Washington Ave., that city.

## Enameling Firm Expands Plant

California Metal Enameling Co., Los Angeles, erected a plant addition, providing 12,600 sq ft of additional floor space. Total plant area is now in excess of 67,000 sq ft.

## Shipping Rate Inquiry Ordered

Investigation of shipping rates on iron and steel charged by railroads, motor common carriers and motor contract carriers in the Eastern Territory has been ordered by the Interstate Commerce Commission.

The action is a result of claims by the trucking industry of unfair

rate structures granted to the railroads (see STEEL, Mar. 22, p. 39). Rates involved included those on iron and steel items between points in Connecticut, Delaware, District of Columbia, Kentucky, Illinois, Indiana, Maine, Maryland, Massachusetts, Michigan, Ohio, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia and West Virginia.

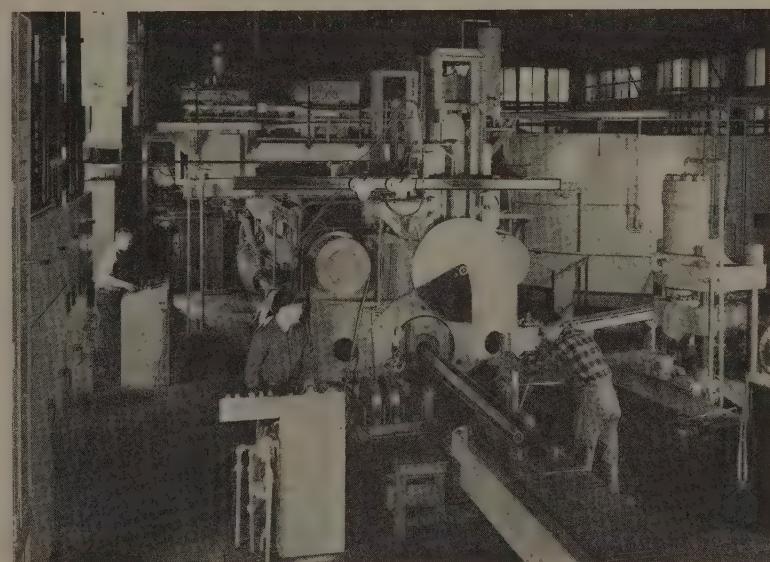
## American Can Company Begins New Labs

American Can Co. broke ground for its Research and Development Center at Barrington, Ill. The laboratory will contain about 102,000 sq ft and provisions will be made for expansion. In addition to administrative offices, the building will house laboratories devoted to food chemistry and nutrition, tin plate, coatings and other specialized research.

## American-LaFrance Modernizes

American-LaFrance - Foamite Corp. announced plans to take the first major step in modernizing production facilities at the Elmira, N. Y., plant. President George R. Hanks said an estimated \$500,000

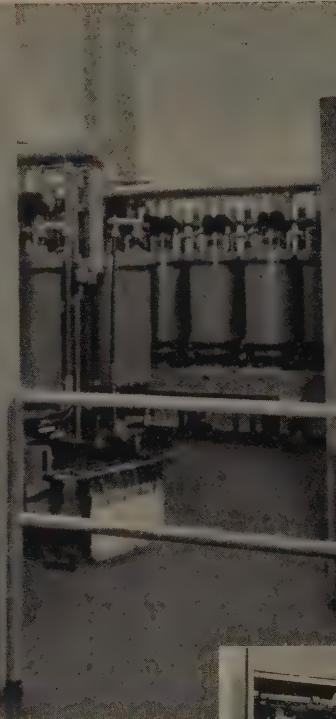
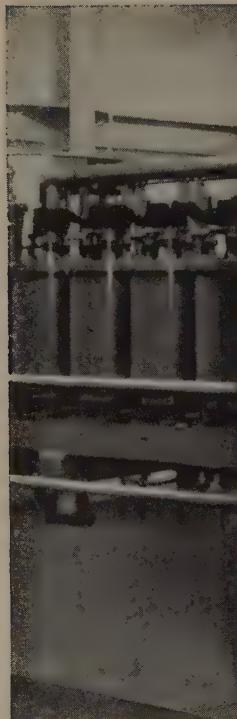
(Please turn to page 124)



## American Brass Installs Heavy-Duty Extrusion Press

A heavy-duty, horizontal extrusion press, recently installed in one of American Brass Co.'s Waterbury, Conn., tube mills, has increased greatly production flexibility and capacity for tube stock for drawing seamless tubes. The press exerts 1900-ton pressure on the main ram and 400 tons on the piercing ram, utilizing hydraulic pressure of 3000 psi. It extrudes round, solid billets up to 10 in. in diameter to produce tube blanks up to 6½ in. OD, weighing up to 350 lb

# 100% DC Power for



**BILLET MILL RECTIFIERS:** Two 1500-kw, 250-volt rectifiers supplying dc service to cranes and runout tables in 30 and 21-inch Billet Mills. Rectifiers are provided with automatic control and provisions for starting and stopping by manual or remote control.

## \***6 OUTSTANDING RECTIFIER FEATURES**

- 1 Continuous Excitation:** pilot arcs always present. Eliminates need for synchronized re-ignition. Enables rectifier to ride through severe ac voltage disturbances.
- 2 Fixed Excitation Anode:** doesn't contact cathode mercury and is independent of level, turbulence or impurities . . . requires no adjustment, maintenance or replacement.
- 3 Internal Cooling System:** high heat transfer with
- 4 Enamelled Anode Seals:** multi-layer fused vitreous construction provides high-strength seal unaffected by thermal variation.
- 5 Grid Phase Control:** in cleaner region near anode, where ion density is lowest.
- 6 Arc-over Free Tube:** insulating entire arc path eliminates danger of arc-over to tube.

**COKE PLANT RECTIFIERS:** One of two 500-kw, 250-volt metal-clad rectifier units supplying dc service to coke plant pusher and coke handling equipment in Coke Oven area. Units are factory assembled and wired, complete with dc switchgear and transformers.

# ALLIS

# FAIRLESS

## Material Handling

**Fairless Works** of the U.S. Steel Corporation — the world's newest and most modern steel mill, continuous dc service is essential to material flow. Any interruption in this critical power supply would cause serious equipment damage and heavy production losses throughout the entire mill. Here, as in other mills over the United States, Allis-Chalmers mercury arc rectifiers are backing up their reputation for continuous, trouble-free operation under various operating conditions.

In dc load centers located strategically throughout this gigantic plant, 19 Allis-

Chalmers rectifiers produce *all* the 250-volt dc supply for every material handling operation . . . from unloading the ore to stockpiling finished steel. These rectifiers are designed and engineered for steel mill duty, and offer highest service reliability and efficiency with low maintenance features necessary for maximum mill output.\*

For the same dependable dc service in your mill, specify Allis-Chalmers mercury arc rectifiers. Call your nearest A-C sales office for complete information, or write Allis-Chalmers, Milwaukee 1, Wisconsin.

A-4302

**ALLIS-CHALMERS**  
**MERCURY ARC**  
**RECTIFIERS**



**OPEN-HEARTH FURNACE RECTIFIERS:** One of two 1500-kw, 250-volt rectifiers supplying service to cranes, pig casting machines, bail-slag cars, and stock house equipment. Provided with automatic control and provisions for starting and stopping by manual or remote control.

**RECTIFIER TRANSFORMERS:** Two 13,800-volt outdoor transformers feeding two 750-kw, 250-volt rectifiers in Central Maintenance shop. Rectifiers supply dc service to maintenance shop cranes, machine tool equipment and provide auxiliary power for electronic testing devices and welding machines.

# CHALMERS

Our Engineers Introduced Mercury Arc Rectifiers to U.S. Industry



(Continued from page 121)  
to \$1 million will be spent in the program.

### Mullins Denies Sale Rumors

Officials of Mullins Mfg. Corp., Warren and Salem, O., denied rumors of impending sale of the company to two different buyers, American Radiator & Standard Sanitary Corp. and General Motors Corp. The president of American Radiator had previously denied the rumors.

The report had indicated that General Motors was interested in the company because of Mullins' patented Koldflo process of steel extrusion. Mullins makes steel kitchens and other pressed steel products.

### Dow To Process Sludge

Dow Chemical Co. at its Freeport, Tex., plant this summer will begin recovering magnesium from sludge, now stemming from its electrolytic production of the light metal.

Construction of the recovery unit is now under way and officials predict that the operation will recover about 2.5 million pounds annually. Dow's magnesium units at

Freeport are currently producing magnesium at the rate of 140 million pounds annually.

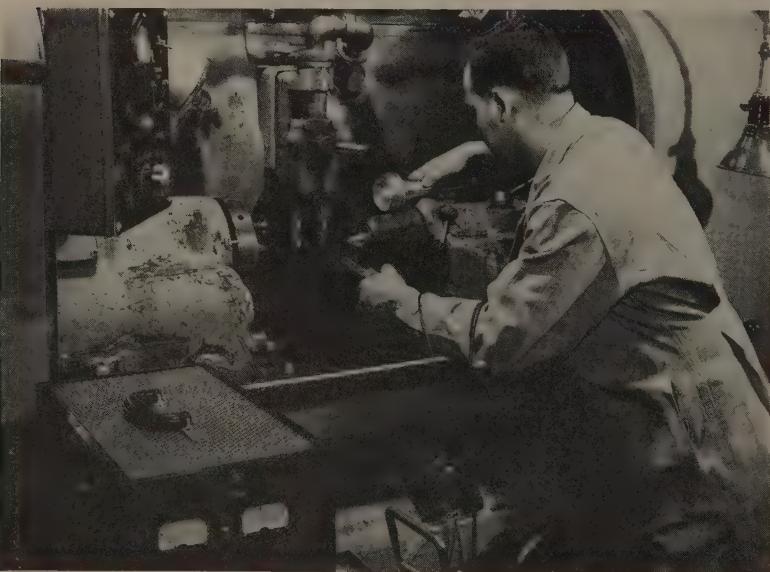
Recovery of the magnesium will be accomplished by crushing and milling the solidified sludge (until now dumped by Dow) to enable separation of the metal from the salts by screening.

### Bethlehem Expands on Coast

Bethlehem Pacific Coast Steel Corp. will expand its 68-acre plant at Vernon, Calif. New features will include three electric-arc furnaces to replace a like number of open hearths, two new rolling mills and a wire mill.

### New Divisions Established

Pennsylvania Salt Mfg. Co., Philadelphia, established two new operating divisions, announced George B. Beitzel, president. The new components, Industrial Chemicals Division and Chemical Specialties Division, will function as complete operating units responsible for both the manufacture and sale of their respective products. William P. Drake will head Industrial Chemicals, and Albert H. Clem will be in charge of Chemical Specialties.



### Industry Gets Counterpart of Physician's Stethoscope

This portable instrument, a Vibratot, will locate abnormal vibrations in rotating parts of a machine without the necessity of dismantling it. The device simplifies the task of detecting out-of-balance parts while a machine is operating. It is used by Timken Roller Bearing Co., Canton, O., to maintain an accuracy within 75-millionths of an inch in production of bearings in commercial quantities

### Armco Acquires Fabricator

Southwest Steel Products will be operated as subsidiary. Firm also expands in Middletown

ARMCO STEEL CORP., Middletown, O., acquired Southwest Steel Products, a steel fabricating company located in Houston. The latter firm's principal products are fabricated reinforcing bars, beams, joists, roof deck and other items used in construction. Russell L. Jolley, president of Southwest, will continue actively in charge of the business which will be operated as a wholly owned Armco subsidiary under the general direction of R. L. Gray. Mr. Gray is vice-president of Armco and president of the firm's wholly owned subsidiary, Sheffield Steel Corp.

Armco also launched a \$430,000 expansion of its Fabricating Division in Middletown. The project will add 32,000 sq ft of floor space to the division's facilities and will include additional equipment for producing the wide variety of fabricated steel products that the plant turns out.

W. W. Sebald is president of Armco.

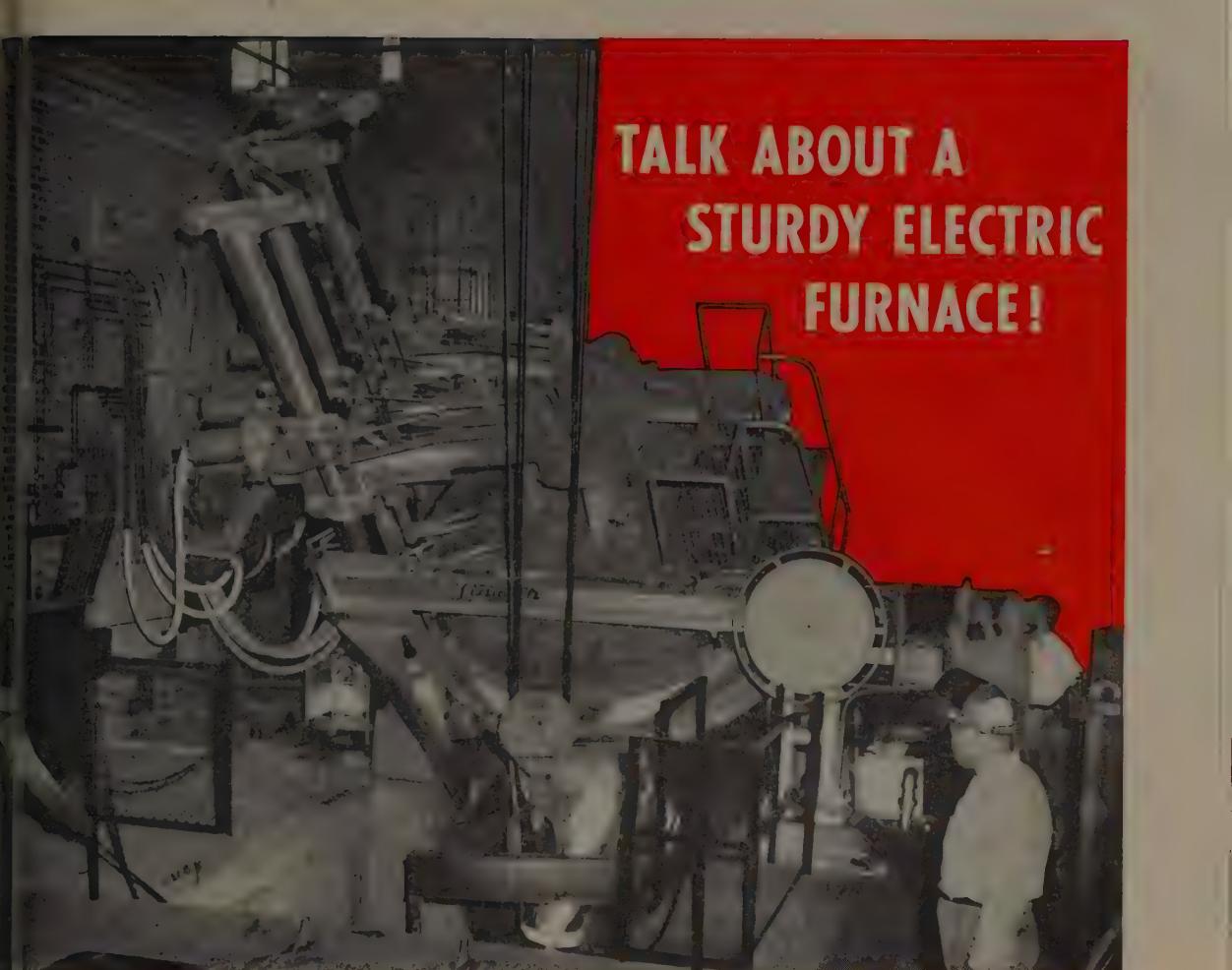
### Bigger Color TV Tubes Coming

Officials of United Specialties Co., Chicago, say that manufacturing problems in fabricating 21-in and 24-in. picture tubes for color television receivers have been solved by a new process they developed in co-operation with Westinghouse Electric Corp. The body of the tube is of a special stainless steel supplied by Armco Steel Corp., Middletown, O.

### Straddle Truck Film Released

Applications of the straddle carrier type of industrial trucks in diverse industries are portrayed in a sound film now available from Clark Equipment Co., Buchanan, Mich., manufacturer of materials handling industrial trucks, construction equipment and heavy transmissions and other drive components for the automotive industry.

The film was shot on location at plants all over the country so that typical operations of the



## TALK ABOUT A STURDY ELECTRIC FURNACE!

"Gold Lectromelt takes the power overload of an oversize transformer without a sign of strain to the furnace or its parts."—Duncan Foundry, Alton, Illinois

### Look at the record

#### of Duncan Foundry's durable Lectromelt\*

In October 1952, this test was made on their 1½-ton per hour Lectromelt: The furnace operated steadily for 27 days, 24 hours per day, using an oversize, 2000-kva transformer. 578 heats were tapped for an average of 21.4 heats per day. Average charge per heat was 6688 lbs. Time from power-on to tap averaged 58.5 minutes per heat. Time from tap to power-on for next heat averaged 8.8 minutes. Average power consumption per ton of metal was 501 kwh.

Duncan's oversize transformer keeps metal pouring fast, but throws a jolting overload of

power into the furnace to do it. Still operating under this maximum stress, their sturdy Lectromelt turns out daily heats without a sign of extra strain or wear.

Expanding recently, Duncan Foundry added another, larger Lectromelt Furnace, confident of its quality and durability.

Look for your new electric in Lectromelt's Furnace line. Write for Bulletin No. 9, describing these versatile melting, smelting, refining and reduction furnaces. Write Pittsburgh Lectromelt Furnace Corporation, 323 32nd Street, Pittsburgh 30, Pennsylvania.

Manufactured in . . . ENGLAND: Birlec, Ltd., Birmingham . . . FRANCE: Stein et Roubaix, Paris . . . BELGIUM: S. A. Belge Stein et Roubaix, Bressoux-Liege . . . SPAIN: General Electrica Espanola, Bilbao . . . ITALY: Forni Stein, Genoa. JAPAN: Daido Steel Co., Ltd., Nagoya

\*REG. T. M. U. S. PAT. OFF.

MOORE RAPID

WHEN YOU MELT...

# Lectromelt



M E M O —

WHERE TOLERANCES ARE CLOSE . . .  
PRODUCTION HIGH . . .  
AND COSTS IMPORTANT . . .

Specify

WALLIN

## WALLINGFORD CLOSE-TOLERANCE STEEL STRIP

When it comes to precision parts like type bars, leading typewriter manufacturers specify Wallingford Steel Strip. They've found that the smooth surfaces and closely held thickness tolerances mean reduced fabricating and finishing costs and insure accurate spacing with smoother, quieter typing action.

The uniform high quality of Wallingford Steel Strip and Tubing doesn't just happen; it's the result of experience, know-how and a determination to produce the best . . . combined with the finest, most up-to-date equipment available. Our new Sendzimir mill, for example, can roll steel strip down to .002" thick and . . . equipped with the most advanced continuous gages . . . will maintain accuracies to  $\pm .0001$ ".

A growing list of satisfied customers look to Wallingford Steel for those important extra values in product quality and service. You too will find that Wallingford can meet your most exacting specifications for size, finish, analysis and temper . . . and can deliver what you want when you want it.

Call us today. We will welcome the opportunity to cope with the tough problem.

THE  
**WALLINGFORD**

SINCE 1922



CO.  
WALLINGFORD, CONN., U.S.A.

LOW CARBON • HIGH CARBON • ALLOY • STAINLESS • STRIP and TUBING

straddle carrier in a wide variety of industries could be covered. Clark recently established Ross Carrier Division for its Ross line of straddle carriers. A. H. Peiro is division manager.

### Airlenco Takes Over Air-Line

Airlenco Inc., Mansfield, O., took over the proprietary business formerly operated as Air-Line Engineering Co. and will produce the same compressed air equipment with some additions to the line. T. J. Farquhar is president and sales manager, and C. N. Walter is secretary-treasurer and production manager.



### ASSOCIATIONS

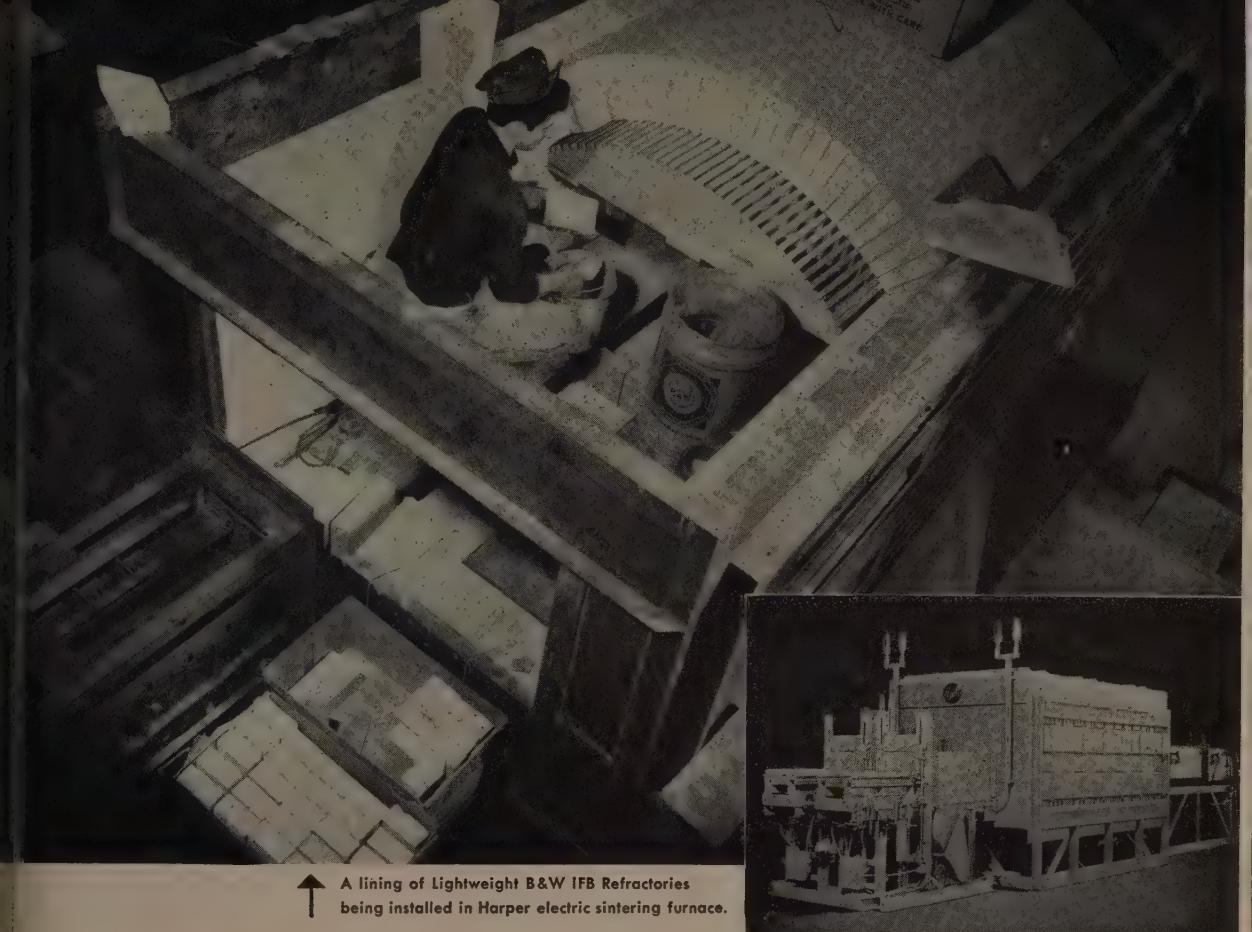
Gen. John J. O'Brien, president of United States Steel Homes Inc., New Albany, Ind., was elected president of Prefabricated Home Manufacturers' Institute, Washington.

R. P. McKenrick, manager, construction equipment department, Blaw-Knox Co., Pittsburgh, was elected chairman of the Manufac-

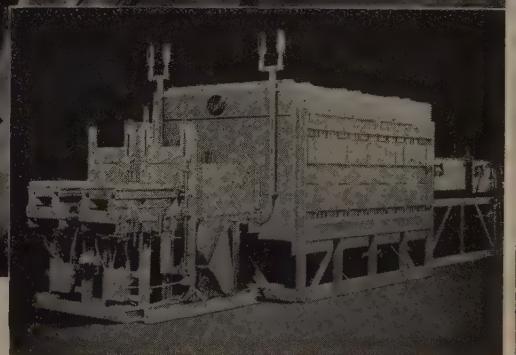


### SKF Turns Out Big Bearing

Shown for comparison at SKF Industries Inc., Philadelphia, is a small roller bearing used in a tube reducing machine that takes ingoing tubes up to 2 1/4 in. OD and a bearing for a machine that will take ingoing tubes up to 18 in. OD. The larger reducer is from Tube Reducing Corp., Wallington, N.J.



↑ A lining of Lightweight B&W IFB Refractories being installed in Harper electric sintering furnace.



## Refractories Maintenance Cut Down ON HARPER ELECTRIC FURNACES AND KILNS

rnace linings that don't last as long as they should can shoot our customers' production costs 'sky high' and take a big bite out of their fits."

hat's one of the reasons why Harper Electric Furnace Corporation standardized on B&W Insulating Firebrick for the electric kilns and furnaces which they manufacture. They know from experience that "B&W IFB last longer than any insulating brick we ever tried."

he reason? Volume stable raw materials, unique quality control and manufacturing processes, including B&W's exclusive double burning at temperatures well above use limits—all these factors contribute to more uniform brick and longer life.

B&W IFB, the lightest weight insulating firebrick, also offer these advantages:

**Cut electricity or fuel costs**—Lighter in weight than any other insulating firebrick, B&W IFB store and conduct less heat. This means faster heating up time, less heat loss during furnace operation. Results? Lower electricity or fuel consumption—often 30% to 50% less than with ordinary heavy firebrick.

**Cut installation costs**—Hand fitting is easy and fast—B&W IFB can be cut, drilled or shaped on the job with ordinary hand woodworking tools.

**Cut down-time**—B&W IFB cool off quicker because they store less heat

—make possible quick access to the furnace for inspection. Furnace gets back on the line faster, too, because B&W IFB heat up quickly.

These savings explain why B&W Insulating Firebrick are being used in thousands of applications . . . from the largest industrial furnaces to the smallest kilns. Contact your local B&W Refractories Engineer. He may point the way to new savings in your furnace.

**BABCOCK & WILCOX**

THE BABCOCK & WILCOX CO.  
REFRACTORIES DIVISION  
GENERAL OFFICES: 161 EAST 42ND ST., NEW YORK 17, N.Y.  
WORKS: AUGUSTA, GA.





any way  
you look  
at it . . .

**SIMONDS**  
ABRASIVE CO.

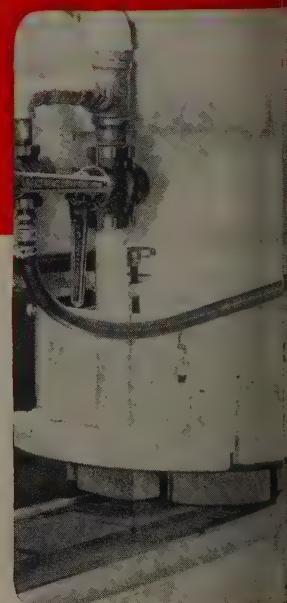
## Abrasive Segments

mean  
surface grinding  
with  
savings

SOLID TYPE →

GAP TYPE →

Less expensive than cylinder wheels. More uniform in grinding characteristics. Easily handled. Quickly mounted. Fast cutting. Compact for less storage. Fit all types of chucks. Gap type for large flat surfaces—solid type for small pieces grouped or chucked together. Write for bulletin ESA-188.



**SIMONDS ABRASIVE COMPANY • PHILADELPHIA 37, PA.**

**BRANCH WAREHOUSES: BOSTON, DETROIT, CHICAGO, PORTLAND, SAN FRANCISCO • DISTRIBUTORS IN PRINCIPAL CITIES**

DIVISION OF SIMONDS SAW AND STEEL CO., FITCHBURG, MASS. • OTHER SIMONDS COMPANIES: SIMONDS STEEL MILLS, LOCKPORT, N.Y., SIMONDS CANADA SAW CO., LTD., MONTREAL, QUEBEC AND SIMONDS CANADA ABRASIVE CO., LTD., ARVIDA, QUEBEC

Division, National Sand & El Association, Washington.

ank A. Cowan, assistant director of operations, Long Lines department, American Telephone & Telegraph Co., was awarded the Lamme Gold Medal by American Institute of Electrical Engineers.

## REPRESENTATIVES

obur Mfg. Co., Burbank, Calif., manufacturer of deburring and deburring tools, appointed as representatives Arthur S. Darling & Associates, Detroit; J. J. Rickert, Overland Park, Kans.; and James Morton Co. Ltd., Galt, Ont.

utting Truck & Caster Co., Hibault, Minn., appointed E. C. Lehr Co. Inc., San Francisco; Production Equipment Co., Meriden, Conn.; and Rushmore, Weber Case Inc., Latham, N. Y., as representatives in those territories.

romat Division of Poor & Co., Lakeview, Ill., appointed Industrial Materials Co., San Francisco, Northern California distributor of Promat metal finishing processes.

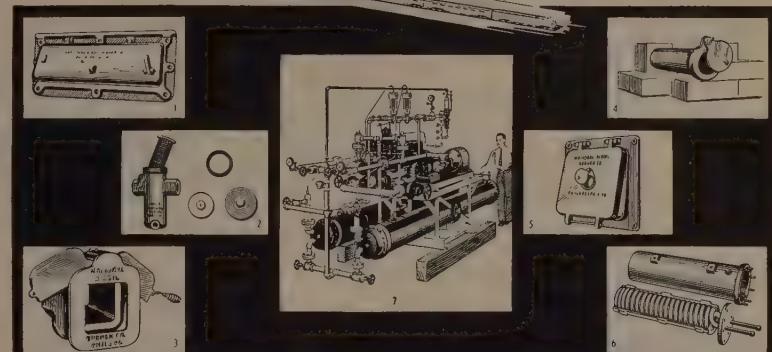
hor Corp., manufacturer of home appliances, opened its first factory sales division in Los Angeles for distribution in eight Southern California cities and counties.

smith bulldozers, root dozers and angle dozers, made by Northeast Machine Works Ltd., Bathurst, N.B., will be sold exclusively by International Harvester Co. of Canada Ltd.

Whitney Chain Co., Hartford, Conn., appointed Macaulay Machinery Co., Rochester, N. Y., as exclusive sales representative in the New York state for the Johnson-Whitney line of machines. Fiagus Machinery Co., Buffalo, was named exclusive distributor for western New York state.

evoe & Reynolds Co., New York, licensed Bakelite Co., New York (Please turn to page 132)

# A Complete Line of COMBUSTION ACCESSORIES



## for EVERY INDUSTRIAL LIQUID FUEL-GAS INSTALLATION

1. Air Control Door and Frame, top hinged, ratchet type, heavy duty, for manual control. Surfaces are machined to a close fit.
2. Fuel Oil Suction Strainer, single type. Large basket area insures low pressure drop; cover and basket easily removed for cleaning.
3. Wide-View Peephole, safety, curtain type. Cobalt glass removed to show bearing surface for curtain. Curtain halves are interlocked—open simultaneously.
4. Ignition Port with Refractory Tile No. M896 . . . for use with standard 3" pipe. Also serves as a peephole.
5. Furnace Relief and Access Door, heavy construction, practically air tight. Door casting correctly weighted, lined with plastic refractory retained by imbedded grill; with observation port and cover.
6. Fuel Oil Heater, Self-Cleaning, Spiral Coil type. High oil velocity in coil, resultant turbulence prevents carbon formation. No internal connections or joints.
7. Fuel Oil Pumping and Heating Unit . . . Twin or Single Pumps, Steam driven, Electric driven or combination Steam-Electric, with Single or Double Fuel Oil Heaters and accessories for feeding oil at constant pressure and temperature.

... yes, just as we are proud of supplying the right liquid fuel or gas burning equipment (over 40 years experience throughout industry), so, also, are we proud of our full line of highest quality accessories to supplement your every combustion need. Within our modern, "daylight" factory, salesrooms and general offices NATIONAL AIROIL likes and adheres to the phrase, "nothing but the best"! We believe that our record speaks for itself . . . i.e.; the "right combination" for you in achieving maximum combustion economy is: NATIONAL AIROIL Fuel Oil, Gas or Combination Oil and Gas Burning Equipment; NATIONAL AIROIL Combustion Accessories; and, NATIONAL AIROIL Engineering Consultation. May we be of help to you in accomplishing your particular installation or in solving that difficult problem?



## NATIONAL AIROIL BURNER CO., INC.

1392 EAST SEDGLEY AVE., PHILADELPHIA 34, PA.

Southwestern Division: 2512 South Boulevard, Houston 6, Texas

INDUSTRIAL OIL BURNERS, GAS BURNERS, FURNACE EQUIPMENT

# The Big Trend in Metalworking...

# *MOVE the metal ...it's cheaper than*

## *HOW NEW METHODS SAVE BIG SUMS*

**A.** Parts are produced primarily by forcing metal into the desired shape rather than by "removing" or "machining" it. It is far faster...saves tremendously in time and labor.

**B.** The amount of metal in the initial slug, shot, billet, sheet, etc., is only slightly more than the total amount in the finished piece. Thus scrap and machining are held to an absolute minimum.

Metalworking plants casting about for ways to reduce production costs are turning more and more to the newer methods of forging, drawing and extruding in which metal is being "pushed around" rather than "removed." These processes basically are the hot extrusion of alloy steel, cold "pressure" forging of aluminum, cold extrusion of steel, and high pressure closed die extruding of aluminum and other non-ferrous alloys. Also falling within this category



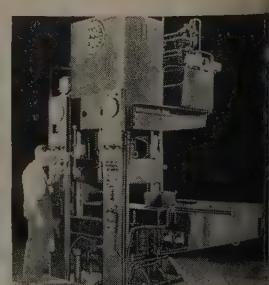
Closed die extruding of heated aluminum reduced production time 99%.



Cold steel extrusion reduced scrap 43%.



Hot alloy steel extrusion is now an established art.



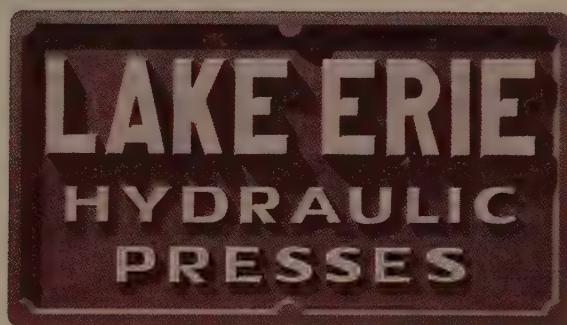
Metal powder parts are often produced with no machining.

● *New and improved production techniques save millions...arouse widespread interest*

1. Actual parts production is cut from hours in typical cases to minutes or even seconds.
2. Pieces generally have superior finish and improved physicals including grain structure.
3. Tolerances and uniformity equal or better those of older methods.
4. Scrap is greatly reduced and in many cases practically eliminated.
5. Unit costs go way down.

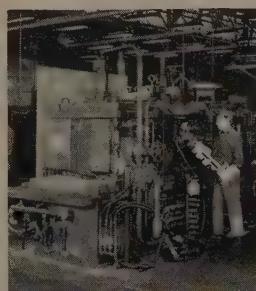
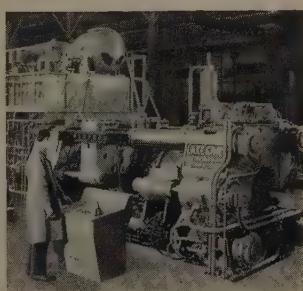
# MOVING it!

re somewhat older though greatly changed in improved methods for the extrusion of aluminum, hot forging of ferrous metals, powder metallurgy, deep drawing of sheet and die casting. The most recent developments involve variations and combinations of the above applied to many products and materials. Our engineers are in close daily contact with these developments. They'll be glad to help apply any of them to your production. Call or write us.



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HYDRAULIC PRESSES • DIE CASTING MACHINES  
ROLLING MILL AUXILIARY EQUIPMENT



Developments in steel  
have greatly expanded  
its application.

Non-ferrous extrusion installations now embrace titanium, magnesium and newer metals.

Production rates of die cast aluminum and zinc parts have been upped 20% to 30%.

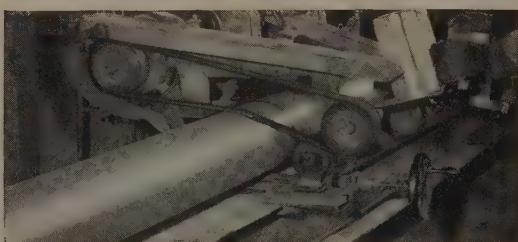
## PACKAGED INSTALLATIONS

A new service by Lake Erie which enables you to order an integrated installation... including production equipment, tooling auxiliary equipment and advisory service... from a single source thereby saving time, money and trouble.

LAKE ERIE®

# HOW WOULD YOU Solve it?

**1 PRODUCTION PROBLEM:** To cut unit costs of polishing aluminum street lighting standards. Pfaff & Kendall, Inc., was finishing one 30-foot pole per hour by hand sanding its entire length as it rotated in a lathe bed.



**2 SOLUTION:** A 3M Representative suggested that this Newark, N.J. manufacturer switch to the 3M Method using Three-M-ite Resin Bond belts installed on two swing grinders mounted in tandem. Poles were rotated in the lathe bed as before. Grinding was done *behind* the contact wheel on the unsupported belt.

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## AEC Buys Containers

This special portable container for field storage of atomic energy project supplies, equipment and instruments was developed by Dravo Corp., Pittsburgh. It has double doors at both ends and is fabricated of welded steel.

(Concluded from page 129)

York, a division of Union Carbide & Carbon Corp., to operate under epoxy resin patents held or controlled by Devoe & Reynolds. Epoxy resins are used in protective coatings, as adhesives, bonding and laminating applications and for parts in the automotive field.

Crucible Steel Co. of America, Pittsburgh, opened a field office in Columbus, O. D. W. Sturgis, sales engineer, has been assigned to the new office.

A West Coast sales office and warehouse was opened in Los Angeles by Cleveland Cap Screw Co., Cleveland. John E. Harrington is in charge.

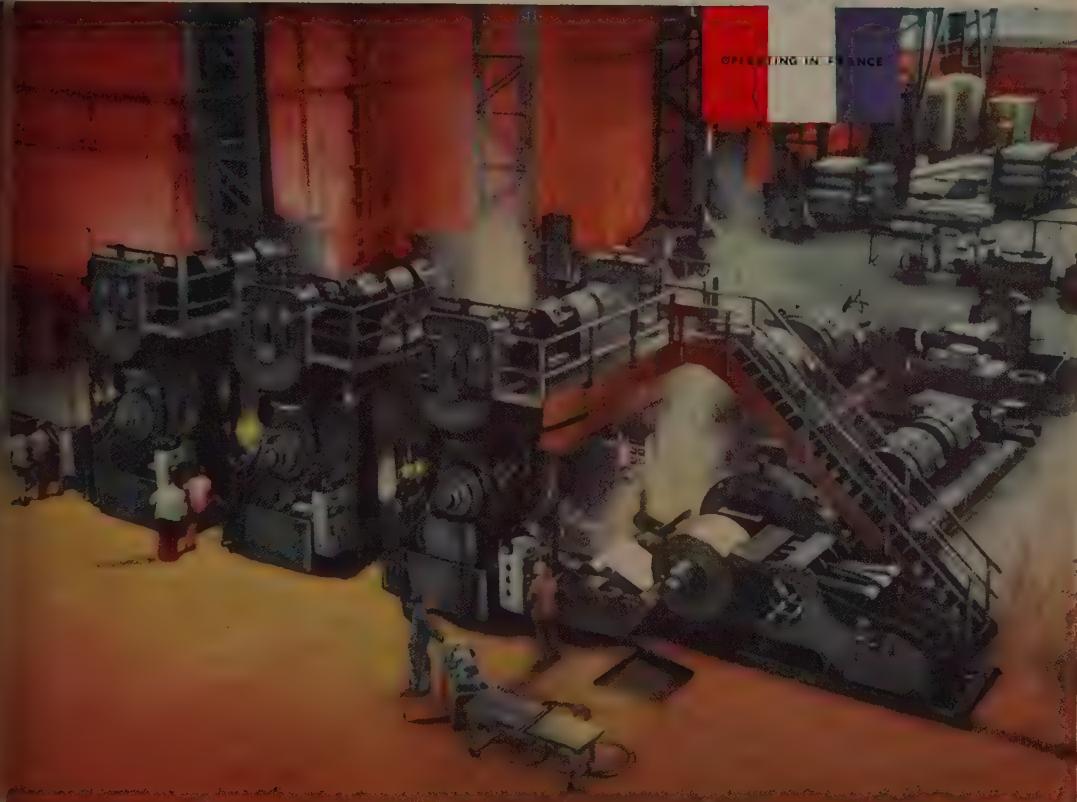
Dravo Corp., Pittsburgh, opened a West Coast office at San Francisco to handle Dravo's complete line of heaters and drying equipment, piping, flooring and other products and services. The office will also represent Walker Process Equipment Inc., maker of water, sewage and industrial waste treating systems.

Jones & Lamson Machine Co., Springfield, Vt., opened a district office at Charlotte, N. C. E. Wells is manager.

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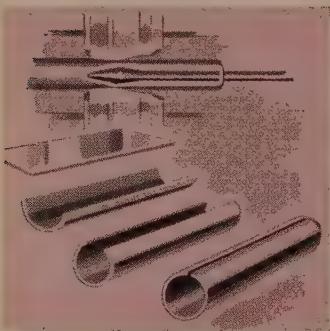
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**2. SEAMLESS AND WELDED TUBING.** As manufacturers of both seamless and electric welded steel tubing, Ostuco's facilities are flexible to meet your needs.

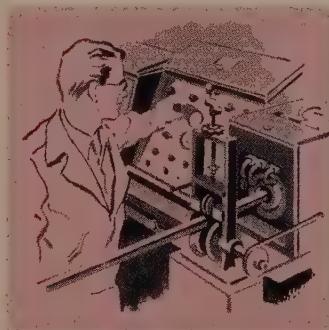


**5. SPECIALTY ITEMS.** Ostuco is especially geared to handle smaller production quantities with the same economy normally possible only in larger runs.

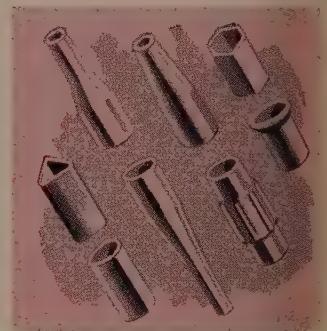
Wherever you use tubing in any form . . . or wherever the advantages of tubing will make your product more competitive . . . Ostuco's *single source service* can save you money. One purchase order takes care of all details. Every manufacturing step from raw materials to finished product is carefully controlled and quality-checked. Your production schedules are rigidly maintained. Other advantages of Ostuco's *single source service* are outlined in an informative booklet, "Ostuco Tubing," yours for the asking. Or better still—for conclusive proof—send us your blueprints for prompt quotation.



**3. VARIOUS ANALYSES.** Ostuco offers carbon and alloy steels which meet all ASM, AMS, ASTM, AISI, and Federal specifications.



**6. QUALITY CONTROL.** Rigid inspection and precision tests at various stages of manufacture assure homogeneous quality and uniformity.



**4. FABRICATING AND FORGING.** Under one roof, Ostuco's modern equipment and skilled craftsmen provide uninterrupted manufacturing, fabricating, and forging service.



**7. CONSULTANT SERVICE.** The diversified knowledge and experience of Ostuco's engineering and design departments is always at your service.



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# TOOLING FOR COMPETITION

TODAY's competitive economy has thrust new responsibilities on the tool engineer.

Historically, his job has been translating plans into production performance. Of course, tooling of the job remains a key facet of his work, but now he is being called in on the initial policy discussions, to add his experience toward making the right decisions the first time—decisions that include the design of a product, selection of tool and die materials, specification of equipment, etc.

As a special contribution to this work, STEEL presents an up-to-the-minute survey of tool and die materials, a report on efficient design and application of jigs and fixtures and a report on one new phase in the tool engineer's daily routine.

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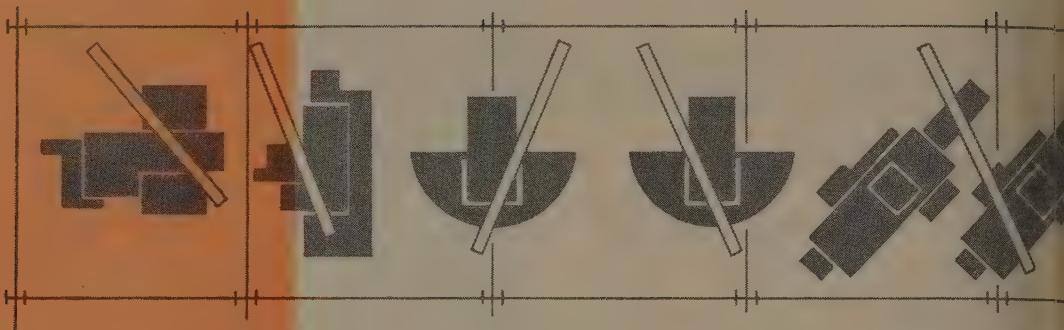
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By ROBERT F. HUBER

Machine Tool Editor

# THE TOOL ENGINEER MOVES UP

## New Voice at the

**His new role involves the same decisions and problems as before. Difference is in timing. He is now consulted before the final, top-level decisions are made**

YOU DON'T expect to hit 100 per cent production efficiency, but still you probably don't agree with the saying, "Close only counts in horseshoes." Every management man reaches for perfection; and the closer he comes, the better he likes it.

**Pooling Know-How**—At least part of the problem is in making right decisions and plans the first time. Sometimes this can be done by a management genius, but more often than not, it is accomplished by drawing on a variety of specialists who can add their knowledge and experience to the management round-table.

This is where the tool engineer comes in. This is his new role. He is no longer thought of as simply the man who takes an assigned product and fits it to a prescribed process.

As an example, for over a year an eastern manufacturer machined and inspected two gears and then welded them together. The weld was to relieve strain on the spline shaft. Finally someone pointed out that the two gears could be made faster and cheaper if they were machined from a common piece of bar stock. Savings for this seemingly simple step are \$2 a piece, and they're made by the thousands.

**Almost Equal**—Actually this new role for the tool engineer involves the same decisions and problems that he has had. The difference is in the timing.

Instead of being handed the product and asked to make it, he is now consulted before the final decisions are made. His production know-how is applied to the product design, sequence of operations, estimations of potential production rates and of unit costs, plant or production line layout and equipment specifications.

**Pooled Resources** — Westinghouse Electric Corp. just completed a new plant in Columbus, O., which will be used for the manufacture of refrigerators. C. L. VanDerau, general works manager, Mansfield, O., plant, points out that, "When we engineered and built our new refrigerator plant, we relied on the combined experience of all our men."

"Tool engineers were called in on the initial discussions to advise on the tooling department, general plant layout and equipment specifications. We drew on the experience and know-how they had gained in making refrigerators at our other plants and used it as a guide to prevent our making cost errors which would then have to be corrected."

**Pre-Design**—At the Caterpillar Tractor Co., Peoria, Ill., it's the practice for tool and product engineers to consult with each other before finalization of the designs. This practice is followed in the design of new products as well as contemplated changes to the design of models already in production. The tool



Caterpillar Tractor Co.

## Management Level

Engineer contributes his knowledge of the available manufacturing facilities; he recommends changes to the products designer which will permit the processing of the parts over existing machinery and tools in order to minimize the cost of placing the parts in production. He recommends processing methods to establish locating points on the part to insure quality as well as economical production.

These recommendations are considered by the products designer, and, if the recommended changes are incompatible with the function of the part, the changes are incorporated in this design. Where the introduction of a new model will require major changes in machine or perhaps an entire line of machines, the tool engineer establishes the probable amount of time the facilities will be out of production for conversion. This information is given to the production department so they can start at the earliest possible date to produce parts to carry the assembly through the conversion period.

A recent example was the redesign of the DW 20 tractor. Final drive case mill had to be widened by moving the side heads out 6 inches on each side and new fixture installed. It was estimated that the machine would be out of production for three weeks, three weeks lead time was built up before starting the job.

**Final Decisions**—With the aid of these and other detailed considerations analyzed, the complete transformation to the new job had been made on paper. Recommendations and suggestions were taken to top management for further discussion and approval.

Actual transformation went smoothly. The new line was in operation well within the deadline and operating at its estimated capacity.

**Stitch In Time**—Commenting on one of the phases of this procedure, Gordon Swardenski, assistant manufacturing manager of the Peoria plant, says, "There is no question but what the tool engineer should be called in before a new part reaches final design stages. His specification of locating points, clearances for pilot bars, etc., will save both time and money which might be lost through error."

In one case the company saved about \$30,000 simply by respecifying a tolerance. That investment would have been necessary to purchase a machine capable of working within the limits required.

**Growing Potential**—With the ever-growing demand for efficient, low-cost production, and the continuing trend toward automation and automatic processing, the cost of management errors will be magnified. The need for practical experience application to key decision will increase and there will be a seat reserved at the management roundtable for the tool engineer.



By A. S. HECKER  
A. W. Hecker Co.  
Cleveland

# Tips To Lower Tooling Costs

If the user would only realize what some of his whims and arbitrary specifications cost him on his tooling bill! Too many of them don't, observes this expert

TOOLING is the key to a successful finished product in all types of manufacturing. Whether we are in a period when price is king or in a period when delivery is of the utmost importance, companies employing the best functional tooling leave competition far behind.

In the constant battle to lower tool costs, many progressive shops incorporate new or improved methods almost daily. But a large portion of the responsibility for producing finer tools at lower prices rests with the process planner and the tool designer. Intelligent planning by these two can mean the difference between a necessary tooling and a profitable tooling expenditure.

## ✓ Supervision Needed

It is common practice when tooling a new or revised product to place the process engineering and/or tool designing with outside firms that provide this engineering service. Right at this point many customers overlook the first phase of economy production. They do not properly supervise their designing work after it has been placed with the vendor.

Untold dollars are wasted on designs that prove to be almost impossible or completely impossible to build. This waste might not have occurred if the vendor had been properly and closely supervised by qualified representatives of the customer, or better yet, if the work had been placed with companies having engineering departments that worked closely with the shop and provided a contract engineering

service. In either case, close customer supervision of tool design in the vendor's location, or in the customer's department will result in tremendous savings in the tooling cost and greatly improve the final tool amortization figure.

## ✓ Tolerances vs. Common Sense

Today it is especially true that tooling dollars wisely spent will produce higher production at lower cost. This does not necessarily mean, however, that cheap tools save the most money. It does mean that dollars spent for what are known as "gold plated tools" or tools loaded with "ginger-bread" are dollars that might well be spent for tools that would perform more than one operation or, on the other hand, more single purpose tools where this is advantageous.

It is very easy for an engineer to write  $\pm .0002$  but quite another problem to maintain it on a machine. Granted, there are certain dimensions where extremely close tolerances are necessary for the successful operation of the tool. Quite often, these "tight" tolerances are not actually required, and in the final analysis, the designer simply wanted to turn out an impressive looking tool drawing. The difference in the building cost between  $\pm .0002$  and  $\pm .002$  can be figured in many hundreds of dollars.

## ✓ Beauty vs. Utility

It can safely be said that most manufacturers prefer to have beautifully finished jigs and fixtures

on their production line. Many feel that better looking tools evoke better workmanship from the men using them.

This idea has merit, but it bears close scrutiny inasmuch as unnecessarily finished surfaces can be extremely costly and could possibly over balance any advantage that might be gained in production workmanship.

## Materials and Methods

is vital that customers' engineering departments and all dependable design companies be constantly abreast of technical advances in materials and methods. Similarly, it is just as vital that design personnel are aware of shop costs and the advantages to be gained by designing tools with an eye toward practical tool construction.

Simple shifts to welded construction, for instance, can save the time and money involved in building a pattern and pouring a casting to say nothing of the danger of excess porosity and the presence of cold spots. Cost conscious design supervision by the customer can help promote more sensible tool designs. Mistakes at this stage can cost real money.

## Current Catalogs

It is extremely vital that catalog libraries in engineering departments be kept up to date and used by the designers. More often than not, process planners and tool designers refer to equipment catalogs and product specification sheets which are close to ten years old.

When the department head or outside vendor who is to build the tool attempts to order some of the components or "so called standard parts," he is faced with the possibility of being advised that the item is no longer manufactured. In some cases, he is able to locate a source at all. Having come to a complete dead end on material, the vendor is then obliged to contact the customer and obtain a clarification or complete engineering modification.

Same procedure would be necessary in the event the customer's own machine shop were building the tool. The resulting delays, while the necessary changes are effected and approved, can stretch into weeks—weeks in which tool dollars and valuable production hours are being wasted needlessly.

## Anticipated Buying

In conjunction with an up to date catalog library, a policy of "anticipated buying" by the engineering department saves weeks and sometimes months in tool deliveries. Briefly, this is how it works;

1. Tool designer finds it necessary to incorporate certain special purchased items (i.e., odd size hydraulic units, special clamps, special bushings) into the Bill of Material.
2. Using latest manuals and catalogs, he lists trade name, model number, and/or dimensions required

(the name of a local distributor often helps a Purchasing Department but is of no value if the tool is being built by a vendor in another area).

3. After tool design is checked and approved for shop use, requisitions for special items are prepared and forwarded to the buying group for immediate purchase.
4. Finished tool prints are sent to prospective vendors for quotations with notation that subject special items will be furnished to vendor.
5. Upon receipt, special items are forwarded to vendor who was awarded job. In many instances, supplier can be instructed to ship items directly to the vendor.

The above procedure would naturally vary according to company practices, but it can be seen clearly that the minimum time saving is two weeks (the average time between the request for quotation and the actual placing of the tool order). Generally, it will save considerably more time.

## Multiple or Single Purpose

Wherever possible, multiple purpose tools should be designed. A milling fixture that can be used for five milling operations instead of one operation may cost 200 per cent more originally, but it would cost 400 per cent more to build four additional fixtures.

Remember, every additional tool must include the certain basic costs in starting a job through the shop. Two individual tools will invariably cost more than one tool performing in two operations.

## Keep Them Clean

Over the years there has been a tendency in some engineering departments ostensibly to lower cost by laying out a complicated tool in its entirety on one sheet of drawing paper rather than placing the assembly drawing on one sheet and the component details on subsequent sheets.

Any money this procedure might save on paper or blueprinting is more than offset by the number of direct labor hours involved in requiring shop personnel to make sketches so that various machined details can be run at the same time in different parts of the shop. When a tool maker or machine operator has to spend time trying to unscramble a crowded or over-complicated tool drawing, unproductive labor hours are being posted to the job.

## Expensive Economy

Inexpensive tooling is not necessarily the most economical in the long run. Cost of tooling must be based on the production quantity requirements. For many short runs, cheaper tools might well suffice, provided that tolerances are not too "tight."

Cheap tooling for long production runs, however, is a criminal waste of money. The tools will not be durable and cannot be depended upon for quality. Constant replacement of supposedly nonperishable tools is expensive. Honest, intelligent appraisal of tool requirements prior to the actual tool designing will eliminate headaches on the production line.

# TOOL AND DIE MATERIALS

## FORUM

Cost-conscious users are imposing new requirements. Chemical and physical properties once considered insignificant are being stressed. Notable gains, for example, are being made in higher-alloy, high-physical property steels. Economy picture is rounded out by new plastics for tools, dies, jigs, fixtures, gages, patterns, locating blocks, for example



CARL BERNDT  
Manager, Warehouse Products  
Timken Roller Bearing Co.  
Canton, O.

CARL BERNDT

### Graphitic Tool Steels Gain Friends Among Users of Cold-work Materials

TODAY'S big news in cold work tool and die materials is the tremendous increase in use and popularity of graphitic tool steels.

Free graphite included in the structure imparts special properties useful in a large number of applications. A carefully-controlled chemical composition makes possible the precipitation of graphite from the total carbon content during mill processing. The structure with included graphite has free machining qualities, high resistance to wear and good anti-frictional properties. Compared to the tool steels, there is less tendency for picking up and scoring.

Graph-Mo, a Timken product, is an oil-hardening grade that could be called an all-purpose tool steel. Owing to its free machining qualities, it can be fabricated into finished tools quicker, and its resistance to abrasion, galling, scuffing and scoring greatly reduces downtime on production lines. It can be metallic arc welded without fear of cracking.

In several large automotive plants, it is being used on blank, form, trim, flange, draw and restrike dies. It has also given exceptional results on wear and heat plates, and has added service life to piercing punches and button dies.

Graph-Mo is available in hollow bars that offer the advantages of reduced machining time and less scrap loss on ring-shaped parts. A large range of sizes is carried in stock.

K. R. BEARDSLEE

### Sees Time When New Carbide Grade Will Demand Better Machines

MACHINE tools are doing an outstanding job with cutting tool carbide grades. In fact, machine tool horsepower has more than caught up with the carbides.

In three or four years, we expect the picture to change. Development of new carbide grades (like our 300 series) that has a tougher grain structure and can withstand



K. R. BEARDSLEE  
General Manager, Carboly Dept.  
General Electric Co.  
Detroit



G. V. LUERSSEN  
Vice President  
Carpenter Steel Co.  
Reading, Pa.



E. J. REITLER  
Carbide Inc.  
Latrobe, Pa.

higher cutting temperatures at the point of cutting) will demand more horsepower from machines.

At tougher grades of cemented carbide tools will bring up problems. The development engineer, for example, will be faced with the task of adapting them to my machines.

As tougher carbides allow faster and deeper cuts, it is possible an advanced method of mechanically clamping blanks or a radically different method of joining may be found. Terrific heat will be generated at the cutting tool edge.

These carbides of the future will play an important part in furthering cold heading and die operations because of their wear resistance. They also will contribute to better hot and cold extrusion methods and the production of solid-carbide pieces up to 4000 pounds.

Some chrome carbides for hot extruding already are giving good results with several nonferrous metals. Carbides under development promise better performance. In the die field, we foresee wider usage of carbides in some of newer materials, larger, beefed-up presses, heavier work loads and larger work pieces.

In blanking and stamping operations, for example, we expect the use of carbides to widen considerably because techniques developed to form carbide pieces with closer tolerances.

Applications has indicated great savings in both tooling and production costs.

Still the research for better steels and fabricating techniques continues. It is a most encouraging sign for the industry, and one more example of the American competitive enterprise system in operation.

#### E. J. REITLER

### Suppliers' Know-how and Techniques Can Give Material Plus Properties

PROCESSING techniques can be the backbone of a product. In the making of preformed sections of carbide, for example, the method of pressing is important.

We use Hydrostatic Pressing. A tungsten carbide powder is placed in rubber balloons and pressed under water. Since water will not compress, more uniform forces are exerted in every direction. As a result, a much more uniform shrinkage is built into the product.

This method of pressing also provides a much more porous-free product. It has been contended that dirt and foreign matter were the chief causes of porosity in carbide. This is true, but we also maintain that proper pressing can do a lot toward creating a much more dense material.

With this method of pressing, we also have practically doubled the transverse rupture strength of our material, to combine the ultimate in strength and wearability.

#### H. J. RENAUD

### Both Money and Time Can Be Saved Using Plastic Dies for Tryouts

WISE USE of plastic materials can pay off in substantial savings in time and money. They are particularly attractive for die development, such as short-run, forming dies, drop hammer, hydro-form and some types of blanking dies. Breakdowns (that would amount to a crisis with hard dies) require only minor repair on plastic dies. Tryout time should not be over 20 hours for a die of any size or shape.

With properly constructed plastic dies (complete plas-

#### G. V. LUERSSEN

### Search for Ways to Stretch Dollars Is Never-ending Quest of Industry

THE METALWORKING industry is definitely not a static business. Alert leaders in every plant and shop are constantly searching for methods of reducing costs and stretching dollars.

Proper tooling is one of the important factors in achieving this objective. Carpenter keeps its research laboratories constantly at work developing new alloy combinations with new properties.

An example of the improved steels springing from its research program is Carpenter Vega, an air-hardening die steel. Analysis was developed to meet the need for a steel having all the advantages of the non-deforming properties inherent in an air-hardening steel, without the disadvantage of high temperature hardening usually associated with them. Experience in many ap-

tic and no metal weldments), extreme draws can be made readily. Apparently, the insulating characteristics of the plastic cause heat retention in the die and sheet metal stock. Heat is generated by molecular friction within the draw stock.

A laminate shell should be free of voids. All sharp corners and radii should be reinforced with glass cloth extending to the surface coat. Cast lockup material for laminate shell must be shrink and void free and have good bonding qualities.

A recent development is the Ren-ite, modified-epoxy, die-surface coat material. It is for dies or other tools where abrasion resistance, wear and hard surfaces are required. Material has abrasion resistance about ten times greater than hot-rolled steel.

Another Ren-ite, modified-epoxy casting material still under development will cure out with considerable toughness. It is for draw dies, hammer form blocks, wedge blocks and other tools where toughness, rather than rigidity and hardness, is required. It will withstand sharp blows and severe impact.

**G. A. ROBERTS**

## Role Played by Sulphur in Steels Is Being Widely Investigated

TOOL and die steels are an ever-changing segment of the alloy steel industry, and 1954 will see no exception to this tradition.

High-speed steels with high-sulphur content and high-carbon, high-chromium steels containing sulphur are being widely tested and investigated by the consuming industry. Two of the latter type, Crocar FM and Ohio Die FM, produced by Vanadium-Alloys Steel Co., have been in use for certain types of saws and shearing tools over 15 years.

Experimental introduction of sulphur into high-speed steel (1920 to 1940) has been expanded to production quantities. Saving is chiefly related to the improved finish. There is no need for special pretreatment of tools generally made from high-speed steel forgings, such as milling cutters and hobs.

Improvement in machinability itself (faster cutting speeds) may be advantageous, but it is too early to tell. Most reports indicate no improvement in performance; but with proper application, there is little reason to suspect that increased brittleness caused by sulphur additions (however properly dispersed) will reduce tool life.

The tool and die industry is becoming increasingly interested in the application of better materials for cold working dies. In keeping are the continued punch and die applications of high-vanadium, high-speed steels given standard or special heat treatment. New and improved hot-work die materials also have been developed for extrusion dies and coining operations.

**A. T. CLARAGE**

## Thinks Users Will Continue Trend Toward Quality, Predictability

THE YEAR 1953 saw further evolution in the tool steel field, and 1954 holds promise of more gains.

Increased use of the higher-alloy, higher-physical property steels last year was of note. While tool steel sales were slightly below 1952's, sales of the high-speed and

hot-work steels gained. To a lesser extent, in the high-carbon, high-chrome field, there was a trend toward non-deforming and shock-resisting groups.

Variations in chemistry made their appearance during the year. Most of them represented higher alloy content for increased physical properties. They did not reach a substantial portion in the market but were sought by and reported of value, and indicate trend. Some interest also is shown in added ingredients, such as rare-earth additives for grain control and forgeability, and nonferrous additives for easier machinability of the tool steel itself.

Probably the greatest gains from the users' standpoint were new standards of microscopic cleanliness in steels and almost perfect control of segregate dispersion. Residual impurities have been reduced to new lows. Tool steel generally has reached new highs in predictability.

Another trend is the large proportion of tool steel being hardened and tempered by professional heat-treaters.

As to the future, it looks like further steps in last year's direction. The specials, with new and higher alloy content, and the additive dopes, are expected to attract some attention. But with today's labor charges, importance of delivery schedules and freedom from downtime, the users' foremost interest seems to be on high-quality, uniformly-predictable tool steel.

**H. E. REPOGLE**

## User Takes Look at Shop, Material In Drive to Reduce Expenses

PROBABLY the most important trend in the use of tool and die steels is the hard necessity of getting lower final costs. To this end we find most users re-examining their tooling practice and seeking improved materials.

A high-speed steel, Unicut, and a die steel, Sparta, are contributing toward higher production at lower overall tool costs. Type analysis of Unicut is C 1, Mn 0.25, Si 0.30, Cr 4, W 6.25, V 2.40, and Mo 6.25. Composition has above average edge strength at hardness values of Rockwell C 65.5 and higher. This, coupled with high abrasion resistance, has led to its rapid adoption for cutting tools where machining is difficult—particularly for broaches and form tools.

Sparta is C 1, Mn 0.65, Si 0.30, Cr 5, V 0.25, Mo 1.25. This air-hardening die steel (although widely accepted) is being discovered by many regular users of oil-hardening tool steel as markedly better than the older type. Superior in size change characteristics after heat treatment, it has greater strength and resistance to shock, plus much better wear resistance than the die steel it is replacing.

With tool-room costs at an all-time high, its use in reducing finish grinding time, and its greater wear life, makes for lower resharpening costs.

**L. V. KLAYBOR**

## New Alloys Are Easier to Handle And Offer Longer Tool Life

RECENT developments in tool and die steels are aimed at improved tool and die life and ease of tool and die manufacture. Broad range of alloys includes high-carbon, high-chromium die steels, high-speed steels, hot-work die steels and water-hardening steels.

In high-speed steels for special purposes, vanadium content has been increased from 2 to 3 to 5 per cent. Most common are M-3 (of the tungsten-moly group) and T-15 (of the tungsten steels). Latter has 5 per cent molybdenum and 5 per cent cobalt. Their chief applications are single point cutting tools, form tools, counterbores, notches and hobs on hard material.

Considerable interest is shown in the free-machining properties of high-speed steels containing 0.10 to 0.16 per cent sulphur and high-carbon, chromium steels containing 0.10 to 0.14 per cent sulphur. Effect of sulphur on tool life has not been completely evaluated.

A high-carbon, high-vanadium steel has eliminatedalling and scoring in forming metals by deep drawing. It is used widely as a die for forming any ferrous alloy. Improved wear resistance of the straight-carbon, water-hardening steels is obtained with additions of 1 to 2 per cent tungsten and 1 to 1½ per cent cobalt to standard, water-hardening steel. Alloy has increased life of cold-heading dies up to 100 per cent.

An alloy for hot-work dies that maintains better high-temperature properties than 9 per cent tungsten, hot-work steel has been developed. It also has better impact properties and higher wear resistance at elevated temperatures. Steel has improved tool life for brass extrusion tools, hot punches and dies for extrusion of tubes.

#### H. W. HIGHRITER

### Voices Need for Standardization Of the Carbide Grades

We anticipate further growth of cemented carbides for cutting tools, dies and wear parts and cast alloys (of cobalt, chromium, tungsten, tantalum, carbon, columbium, etc.) for cutting tools, wear parts and resistance to chemical and corrosive attack.

Carbide development has not reached the standardization of high-speed steels, but through the efforts of large users and manufacturers, there is a trend in that direction. Last year a significant step was taken by the formulation of a carbide standardization committee section of ASTE, working in co-operation with ASME and SM.

At one time we were of the opinion that cast cutting alloys (of the Tantung and Stellite types) gave a good account of themselves only where machine tools did not have sufficient speed, power or rigidity to use carbide tools successfully. It appears now that we may have underestimated them.

A case in point involves dies for drawing figure 8 colley wire. Wire was formerly drawn in fragile and expensive carbide dies. We suggested replaceable nibs of cast Tantung, expecting lower production per nib but in over-all economy—because the new material cost only 10 per cent as much as the carbide. However, in many instances, the Tantung nibs performed as well or better than the carbide.

#### G. K. SIMONDS JR.

### Flat Ground Die Steels Offer Way To Trim Machining Costs

FLAT ground, die steel offers savings in time and labor, instead of spending hours milling, planing and grinding



H. JAMES RENAUD  
Vice President  
Ren-ite Plastics Inc.  
Lansing, Mich.



GEORGE A. ROBERTS  
Vice President of Technology  
Vanadium-Alloys Steel Co.  
Latrobe, Pa.



ARTHUR T. CLARAGE  
President  
Columbia Tool Steel Co.  
Chicago Heights, Ill.



H. E. REPROGLE  
Manager, Tool Steel Sales Develop.  
Universal-Cyclops Steel Corp.  
Bridgeville, Pa.



L. V. KLAYBOR  
Associate Director of Research  
Allegheny Ludlum Steel Corp.  
Pittsburgh



HARRY W. HIGHRITER  
Vice President  
Vascocoy-Ramet Corp.  
Waukegan, Ill.



J. Y. RIEDEL  
Tool Steel Engineer  
Bethlehem Steel Co.  
Bethlehem, Pa.



FRANK B. RACKLEY  
President  
Jessop Steel Co.  
Washington, Pa.



C. T. FLETCHER  
Research Metallurgist  
Braeburn Alloy Steel Corp.  
Braeburn, Pa.

to prepare the raw bar, the die maker using this material can begin work where his skill is best utilized.

Simonds has two basic steels to satisfy majority requirements. They are nondeforming types of tool steel—a manganese-molybdenum, oil-hardening grade and a chromium-molybdenum-vanadium, air-hardening grade. Both have 100 per cent spheroidized, full-annealed microstructure that combines excellent machinability and uniform response to heat treatment.

Oil-hardening grade is particularly suitable for the smaller tool, die and machine shops. It can be heat treated over a wide hardening range. Where better wear-resistance is needed for long production runs or the application is more critical, the air-hardening grade is indicated.

Improved grinding techniques make it possible to mass produce ready-to-use die steel to closer tolerances, smoother finish and greater uniformity than generally attained in average shops. Thickness is held to  $\pm 0.001$  inch. Surface finish is maintained at 25 to 35 micro inches.

Standard-size bars, in flats and squares, are generally available from local stocks in industrial supply houses and tool steel warehouses. Off-the-shelf sizes range from  $\frac{1}{4}$  to 3 inches thick and  $\frac{1}{2}$  to 14 inches wide in standard 18-inch lengths. (Mr. Simonds is president of the Simonds Saw & Steel Co., Fitchburg, Mass.)

excellent performance when properly applied. They are not suited to shock-resisting applications.

Bethlehem has developed an air-hardening, shock-resisting steel that fills the need where D2 and A2 types are not suitable. Known by the trade name, "Bearcat," its typical composition is 0.50 C, 3.25 Cr and 1.40 Mo.

"Bearcat" offers: Maximum shock-resistance, air hardening, low distortion in heat-treatment, deep-hardening, easy machinability (Brinell 197 max), good hot-work properties and is easy to carburize.

Primarily a shock steel, it is a good choice for any shock job where wearing conditions are not extreme. Some typical uses are rivet sets, punches, blanking and forming dies, hot headers, gripper dies, short-run dies, moil and buster points, chisels, master hobs, machined-cavity molds and die-casting molds.

#### F. B. RACKLEY

### Now Users Are Challenging Suppliers To Upgrade Quality, Efficiency

WE believe the tool and die industry is facing a challenge thrown down by its customers. The battle cry is "quality and efficiency."

Importance being given to efficiency (the cost factor) in today's competitive market is reflected in the increased demand for ground flat stock, both oil hardening and air hardening.

In the manufacture of dies, gages, verniers, etc., cost-conscious management has found that paying a little more for finished stock is more than compensated for by elimination of preliminary machining. This is but one example of how we are meeting the trend.

Purple Label (C 0.74, Cr 4.20, V 1.10, Mo 0.75 max, Co 5) is our 18-4-1, plus 5 per cent cobalt, type of high-speed steel. In general, it's used for hogging cuts, rapid speeds and cutting hard, scaly and tough materials.

Dica B is an air-hardening, hot-work die steel especially suited for die casting aluminum-base alloys. Its analysis: C 0.35, Si 1, Cr 5, V 0.20, Mo 1.50.

Windsor is an air-hardening, hot-work die steel—C 1, Mn 0.50, Cr 5, Mo 1.25, V 0.30. Easily machined and nondeforming, it is for applications that require great abrasion resistance.

Truform is a general-purpose, oil-hardening, nonde-

J. Y. RIEDEL

### Air-hardening Tool Steel Excels Where Heat Treatment Is Desired

AIR-HARDENING types of tool steel have firmly established themselves in the last 15 years.

Air-quenched tools never crack in heat treatment. Because they lack sensitivity to possible cracking during hardening, tools of complicated designs can be produced—designs that would be impractical if liquid quenching were required. And, compared to liquid quenching, size changes in tool dimensions are much less during hardening by air quenching.

Wide use of two types of air-hardening tool steel is recognized by SAE classification. SAE type A2 contains 1 per cent C and 5 per cent Cr. SAE type D2 contains 1.5 per cent C and 12 per cent Cr and will be recognized as high-carbon, high-chromium type. Both give



H. M. GIVENS JR.  
General Manager, Tool Steel Sales,  
Crucible Steel Co. of America  
Syracuse, N. Y.



FRANK L. BOGART  
Sales engineer, Detroit branch  
Marblette Corp.  
New York



DAVID J. GILES  
Senior Vice President  
Latrobe Steel Co.  
Latrobe, Pa.

Forming alloy tool steel for use where extreme accuracy is desired. Its analysis is the same as ground at stock—C 0.90, Mn 1.20, Si 0.30, W 0.50, Cr 0.50. Applications include blanking dies, burnishing gears and drawing dies.

Numerous orders also are received for composite die sections. Here, expensive tool steel is inserted in a carbon-steel backing, where only a minimum of tool steel analysis is necessary.

#### C. T. FLETCHER

### High-vanadium, High-carbon Classes Are Being Used Extensively

ADVANCED testing techniques and better mill inspection have had a lot to do with the marked quality improvements in many tool steels the last several years. At the same time, application of tool steels has been steadily undergoing important changes.

Significant trends are apparent in the use of high-speed steels. One is the growing use of high-vanadium, high-carbon classes, mostly based on M-2 composition. M-3 types, in particular, have been widely adopted. They are used extensively for broaches and form tools.

Another trend is the return to tungsten-cobalt grades for heavy-duty cutting tools. Free machining types of the molybdenum, high-speed steels also have been made available. They have high sulphur and may be useful where machinability is of prime importance.

Quite noticeable in cold-work steels is a tendency toward a shift from the oil-hardening type to the 5 per cent chromium (air hardening) and the high-carbon, high-chromium grades.

Much research and development is being done on hot-work steels. One new alloy (Congo Hot Work) is a high-cobalt, precipitation-hardening steel marketed by Braeburn Alloy Steel Corp. It has been used successfully for hobs in beryllium-copper, pressure casting and is under development for tooling in aluminum and brass extrusion, aluminum die casting and certain brass and steel forging operations.

Other new hot-work steels: A 6 Mo, 4 Cr, 1 W grade has been found especially suited for solid dummy blocks in brass extrusion. A 5 Cr, 5 W grade is making a good showing in mandrels for brass and aluminum extrusion.

#### H. M. GIVENS JR.

### Fabrication of Ring-shaped Parts Is Faster with Hollow Bars

HOLLOW bars of tool steel are designed to speed the fabrication of ring-shaped parts traditionally cut from solid bars or special forgings. Stamping dies, can dies, liners, ring gages and trim dies are typical uses. Parts can be made cheaper because the fabricator by-passes high cost machining of central areas.

Crucible's hollow, tool-steel bars have a prior machined surface and hole. Five of its tool steels are available from stock as hollow bars. Grades are Sanderson, water-hardening tool steel; Ketos, oil-hardening tool steel; Airkoal, air-hardening tool steel; NuDie V, hot-work tool steel; and Airdi 150, high-carbon, high-chromium tool steel. Although other grades are available on mill delivery, these are designed to meet the majority of tool and die applications.

Sanderson is a high-carbon, special-quality tool steel for applications requiring case and core characteristics. Ketos is a general-purpose, chrome-tungsten alloy tool steel for applications needing less distortion and heat treatment than could be tolerated with water-hardening tool steel.

Airkoal is a 5 per cent, chrome-molybdenum-vanadium die steel. It has high toughness, good resistance to wear and minimum distortion in heat treatment. NuDie V is an air-hardening, low-carbon tool steel used for tools and dies subject to heat. Airdi 150 is used for maximum resistance to wear and size change. Warehouse stocks range from 2-inch Rd. with a 1-inch hole to 16-inch Rd. with a 12-inch hole.

#### F. L. BOGART

### Low Fabrication and Finishing Costs Are Key to Plastic Tools, Dies

IN THE PAST, low fabrication cost of plastic dies was frequently offset by the need to repair and service tools that would not stand up under abrasion for a long production run. Dies for large panels often needed servicing after every thousand panels or so. Repairs took a

matter of minutes, but they called for a skilled workman.

A phenolic, casting material with good strength is resin No. 78, product of the Marbllette Corp. Exceptionally stable, it has a shrinkage rate of about 0.0005 inch per inch; impact and compressive strengths are 25 to 50 per cent better than previous phenolics.

The resin was primarily developed for cast tools that obtain higher impact strength by being constructed with a laminated skin filled with cast phenolic.

Average cost of plastic tooling is about 50 per cent cheaper than other types. Saving is not in the cost of the material, which is about the same as steel on a per-cubic-foot basis. Economies stem from the elimination of expensive equipment for fabrication and labor costs connected with finishing. Tools with much contour offer largest savings.

An example of a successful experimental draw die was made with resin No. 78 by Rizzo Bros. Engineering and Mfg. Co., Detroit. It ran 1200 panels of 0.033 cold-rolled steel with no sign of wear. A restrike die to form depressions in a ridge on the part ran 150 panels. After an impression worn in the tool by severe gouging was cold-patched, it stood up for 150 more panels. Steel inserts were embedded at the point of severe wear, and the remainder of the 1200-panel run was trouble free. Two tools could run in excess of 20,000 panels before further service.

#### D. J. GILES

### Self-lubricating, Free-machining Steels Attract Attention

SINCE the close of World War II, steady progress has been made in the development and application of new and improved steel compositions for all types of tools and dies.

They include: Molybdenum-base, high-speed steels, super-high-speed and abrasion-resisting die steels (containing high carbon and vanadium) and precipitation-hardening die steels for specialized work.

Development of improved steel manufacturing techniques has resulted in much more uniform quality tool steels of conventional composition, leading to better properties and top performance. This was brought about by positive control of carbide segregation, pioneered by Latrobe Steel Co.

Recently announced self-lubricated, high-speed steels and free-machining, high-carbon, high-chromium die steels are attracting a lot of attention.

Marked increase in tool life of self-lubricated steels is especially vital. Steels themselves are of conventional analyses, except for the special sulphide additives. They give needed lubricity at the cutting edges. Improvements are reported to range from a few to several hundred per cent, depending on the type of tool.

High-carbon, high-chromium steel dies with sulphide additives are easier to fabricate because of vastly improved machinability. Other properties are unimpaired; impact strengths and heat treatment are the same; and there is evidence of improved die life.

#### W. L. KENNICOTT

### Designers of Carbide Cutting Tools Become Maintenance Conscious

SWING to tool designs that need less maintenance is the outstanding trend of the past year in carbide cutting tool usage.



W. L. KENNICOTT  
Chief Engineer  
Kennametal Inc.  
Latrobe, Pa.

Consistent high performance results from unstrained assemblies of well-proportioned, cutting inserts mounted in rugged, heat-treated steel holders. Major cutting forces are transmitted to the holder's solid surfaces without straining the clamping or holding device. Assemblies allow full use of the cutting insert's properties, harder carbide grades, higher operating speeds and heavier feeds.

Indexable inserts that accurately repeat minimize downtime while changing cutting edges. Precision factory-ground carbide rounds or prisms, which bring the cutting point to within 0.001-inch of the same position when indexed or replaced, are commonly used—closer controls are available when required. Inserts eliminate resetting of stops and reduce tool changing downtime to a fraction of that usually required.

Cylindrical, square, triangular and diamond prisms can be reground simply on the ends only after all positions are dulled, providing six to 14 fresh cutting edges, in about the same grinding time previously needed to recondition a single tool. Nose radius, point and edge are automatically controlled. Likelihood of damage in grinding is greatly reduced.

Examples of progressive thinking in metal cutting tool design emphasize three advantages: Unstrained assemblies for improved cutting performance, indexable, quick-change cutting inserts for minimum downtime and simplified regrounding (or no regrounding) for reduced maintenance costs.

#### DALE KNEPP

### Plastic Research and Development Aimed at Improved Physicals

EPOXY resin tools reinforced with fiber glass are widely used for jigs, fixtures and mastering applications with excellent results.

But laminate construction has limitations—delamination under compression and impact, high labor cost for large masses and variations in physical properties caused by air voids, cloth bridging and inconsistent wetting. Kish Resin has developed epoxy casting resins and application techniques with an eye to overcoming these difficulties.

With new epoxy backup resin, large masses may be

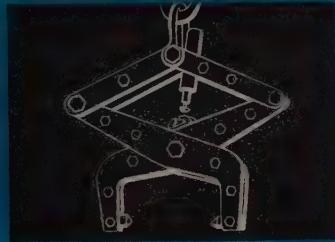
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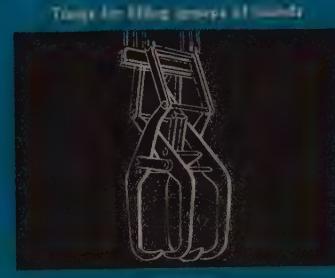
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Kish Resin Inc.  
Lansing, Mich.



JACOB S. DISSTON JR.  
President  
Henry Disston & Sons Inc.  
Philadelphia



T. G. BARNES  
Vice President of Sales  
Firth Sterling Inc.  
Pittsburgh

cast with low exotherm, excellent stability and physical properties. Resin is poured at room temperature and oven-cured.

Three surface-casting resin formulations range from an extremely hard surface to a resilient one comparable to a rubber tire. They may be applied to wood, metals and other plastics from  $\frac{1}{4}$  to 1 inch thick, depending on the backup structure. Pouring and curing are at room temperature. Mold shrinkage is from 0.0001 to 0.0004 per inch. Adhesion and stability are excellent.

With epoxy core resin, large light-weight dies may be cast without shrink patterns. All plastic construction eliminates the differences of expansion and contraction in composite constructions of metal and plastic.

Kirksite and lead drop-hammer dies have been surfaced with cast, epoxy, surface resins for long production runs of aluminum and stainless panels. Surface of rigid plastic  $\frac{1}{4}$  to  $\frac{1}{2}$  inch thick is cast directly to a Kirksite backup from a plaster splash. To form the punch, a surface of resilient epoxy is cast from  $\frac{1}{4}$  to  $\frac{1}{2}$  inch thick to a Kirksite or lead backup.

J. S. DISSTON JR.

## Composites Team Up Best Features Of Two Metals for Tooling

COMPOSITE metals offer a way to combine the desired features of two different metals for better efficiency and lower cost. By integrally compositing tool steel and low-carbon steel, a machine knife is produced that has a hard cutting edge reinforced with a steel of necessary toughness.

Hard cutting edge is usually an insert of special tool steel; backing material is usually low carbon or low-carbon alloy steel. Manufacturing begins with the reinforcing steel in the billet condition.

Success of hardening depends upon the skill with which the composite steel bar is preformed (when necessary) prior to heat-treating. Each metal has its own coefficient of thermal expansion. Preforming is done by heating and bending the bar flatwise and edgewise, to give the insert side a predetermined amount of convex shape in each direction.

Preformed bar is heat-treated for optimum mechanical and physical properties of the insert steel by quenching

from the right hardening temperature and subsequent tempering. After heat treatment, the backing metal is tough and not materially hardened. Heat-treated bar is straightened and ground to size and shape. Drilling, tapping and slotting are done after hardening, to minimize hardening distortion.

This type of composite steel is used for paper, veneer, planer and other high-quality knives exposed to considerable abuse in service. They must have edge holding qualities equal to solid, tool steel. Knives range up to about 125 inches long, 10 inches wide and 1 inch thick.

T. G. BARNES

## Chemical and Physical Properties Take on New Significance

THERE is no single significant basis for the selection of tool and die materials. Neither is there a material that combines maximum performance and economy for all applications.

But automation, the power age and the general desire of industry to produce more economically have imposed new requirements. Chemical and physical properties, regarded insignificant years ago, are being highlighted.

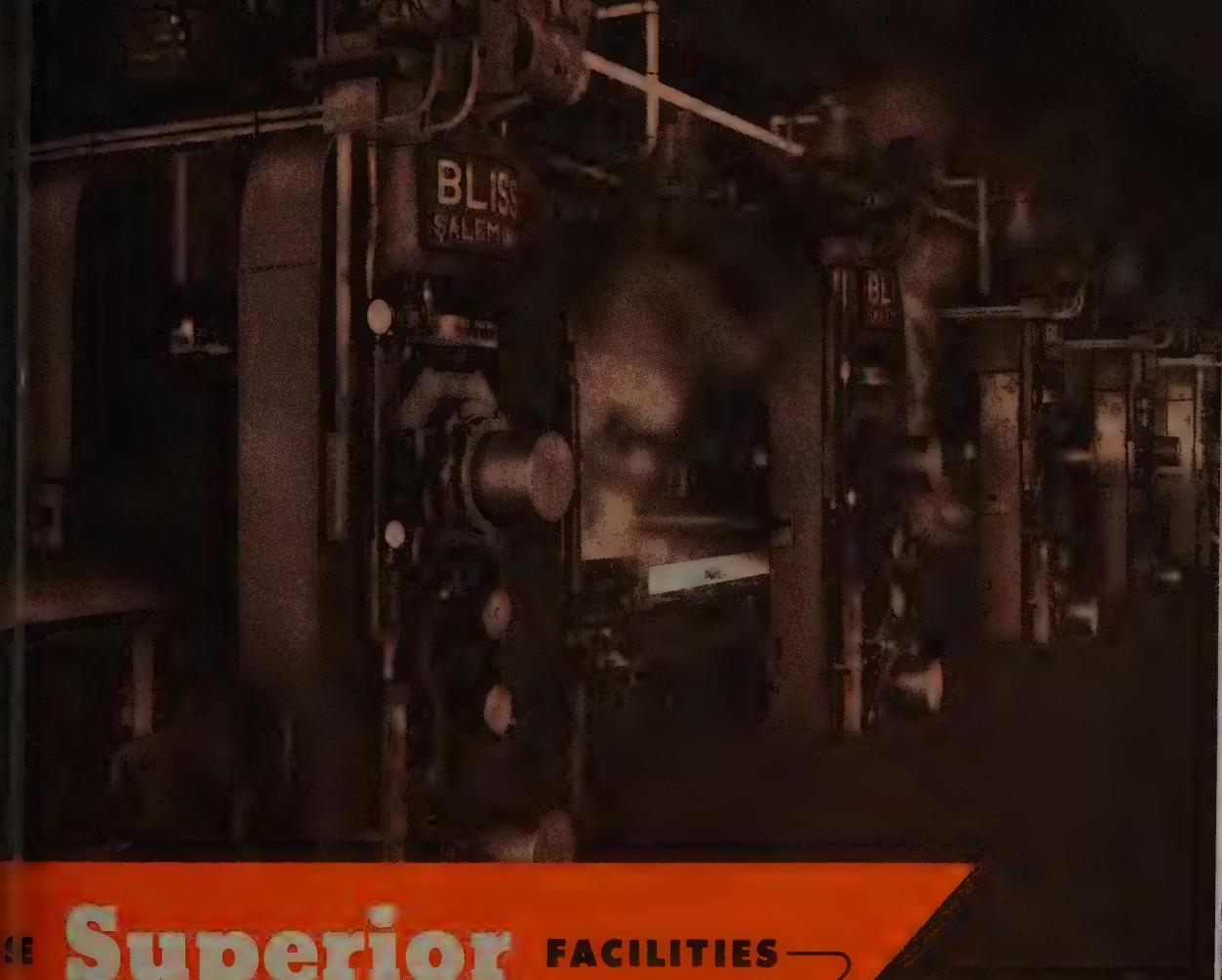
Chemical and physical properties at room temperature, for example, may no longer be a criteria of performance. Operating temperature must be given proper consideration. Hardness is not the sole contributor to wear resistance.

Less expensive tool steels, designed to satisfy conditions met by costlier steel containing large percentages of strategic materials, offer a few examples of how Firth Sterling is meeting the challenge.

Standard production items include carbides, such as chromium-carbide. It has resistance to chemical attack and oxidation, is lightweight, may be highly polished and has a coefficient of expansion similar to steel.

Titanium carbide and cermets lend themselves to hot-work and are extremely desirable when weight is a chief factor. They, too, are oxidation resistant—even to a higher temperature range than chromium-carbide.

Heavy alloys, such as Firth's heavy metal, combine high temperature hardness and strength. They have proved outstanding for forging and extrusion dies.



# Superior FACILITIES

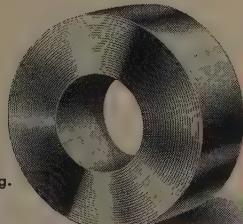
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## CONFERENCE AND INDUSTRIAL EXPOSITION

# PROGRAM OF CONFERENCES

Convention Hall, Philadelphia—April 26-30, 1954

### ASTE HEADQUARTERS ROOM—Independence Room—Benjamin Franklin Hotel

#### MONDAY, APRIL 26

##### 1:30 p.m. Room 300

Convention Hall

##### Solutions to Problems in Producing Thin-Walled Parts

Those fragile cylindrical parts with walls as thin as 0.001-inch that are tough to solder, braze or weld

1a. Rolled Extrusion of Thin-Walled Parts (22T1)—W. N. Parker, development engineer, RCA Victor Tube Division, Radio Corp. of America

1b. (2:15) Rubber-Clamping Assembly of Thin-Walled Parts (22T2)—F. R. Simpson, director of research & development, Kulfjian Corp.

##### 1:30 p.m. Arena Conference Room

Convention Hall

##### What's New and Economical with Surface Cleaning

Especially where you need better surface finish control or you've got to get at difficult hidden surfaces

2a. Surface Finish Control with Blast Cleaning (22T3)—A. P. Neumann, chief engineer, Vapor Blast Mfg. Co.

2b. (2:15) Ultrasonic Techniques in Industrial Cleaning (22T4)—Dr. W. L. McCracken, director of research, Detrex Corp.

##### 3 p.m. Ballroom

Convention Hall

##### How to Take the "Bugs" Out of Your Production Planning and Control

Experts in the areas of management, planning and operations will answer questions on design and use of operations process sheets, flow charts, operator's instruction sheets, machine loading schedules and scheduling, routing and dispatching operations and paperwork—whether large or small plant and high or low production

##### 3. Production Planning and Control (Panel Discussion):

E. Kitzman, general superintendent Link-Belt Co.  
H. R. Murphy, planning department head Grumman Aircraft Engineering Corp.  
N. M. Perris, senior associate Stevenson, Jordan & Harrison Inc.  
W. L. Tann, chief industrial planning eng. Bureau of Ordnance, Navy Department  
C. Verkler, asst. manager of mfg. Caterpillar Tractor  
J. R. Weaver, manager of mfg. & eng., Westinghouse Electric Corp.

##### 8 p.m. Ballroom

Bellevue-Stratford Hotel

##### How to Utilize and Develop Your Employees' Executive Potential

Giving them a bigger part in production planning and keeping the better men moving up the ladder. It pays big dividends

4a. A Program for Developing Tool Engineers Into Manufacturing Executives (22T5)—Dr. R. F. Pearson, senior associate, Washington Associates Inc.

4b. (9:00) Scallop Employee Relations Plan at Different Production Levels (22T6)—E. M. Dowd, executive vice president, La Pointe Machine Tool Co.

##### 8 p.m. Burgundy Room

Bellevue-Stratford Hotel

##### How to Spend Less on Actual Research and Yet Profit More From It

5a. Recent Developments in Analysis of Chip Formations (22T7)—Dr. B. W. Shaffer, project director, Research Division, College of Engineering, New York University

5b. (9:00) Turning Research Can Double Your Production Per Labor Hour (22T8)—J. C. Herbert, manager, Machine Tool Division, Jones & Lamson Machine Co.

### NATIONAL SOCIETY FUNCTIONS

#### TUESDAY, APRIL 27

##### 7:30 p.m. President's Reception and Caucus

Crystal Ballroom—Benjamin Franklin Hotel

#### WEDNESDAY, APRIL 28

8 a.m. Canadian Chapter Breakfast  
Betsy Ross Room—Benjamin Franklin Hotel  
9 a.m. House of Delegates Meeting  
Crystal Ballroom—Benjamin Franklin Hotel  
12 p.m. House of Delegates Luncheon  
Crystal Ballroom—Benjamin Franklin Hotel

#### THURSDAY, APRIL 29

9 a.m. Board of Directors Meeting  
Crystal Ballroom—Benjamin Franklin Hotel

##### 12 p.m. Board of Directors Luncheon

Crystal Ballroom—Benjamin Franklin Hotel

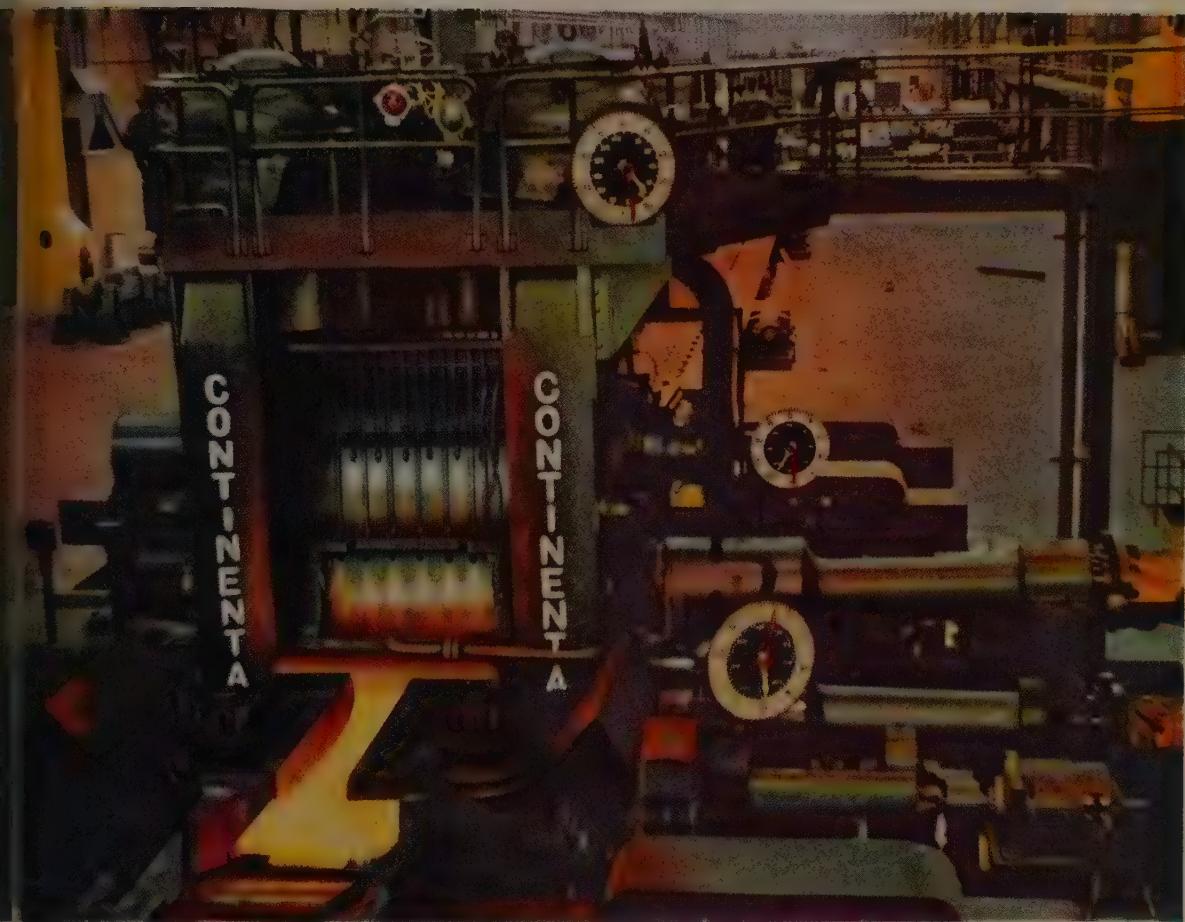
7 p.m. Annual Meeting Banquet and Installation of National Officers  
Ballroom—Bellevue Stratford Hotel  
(For Banquet reservations, at \$7.50 per plate, send your check to ASTE Headquarters in Detroit.)

#### FRIDAY, APRIL 30

9 a.m. Board of Directors Meeting  
Betsy Ross Room—Benjamin Franklin Hotel  
12 p.m. Board of Directors Luncheon  
Betsy Ross Room—Benjamin Franklin Hotel  
12 p.m. to 4 p.m. Educators—Engineers Luncheon and Conference  
Poor Richard Room—Benjamin Franklin Hotel

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ROD MILLS  
MERCHANT MILLS

CASTINGS—carbon and alloy steel  
from 25 to 300,000 pounds

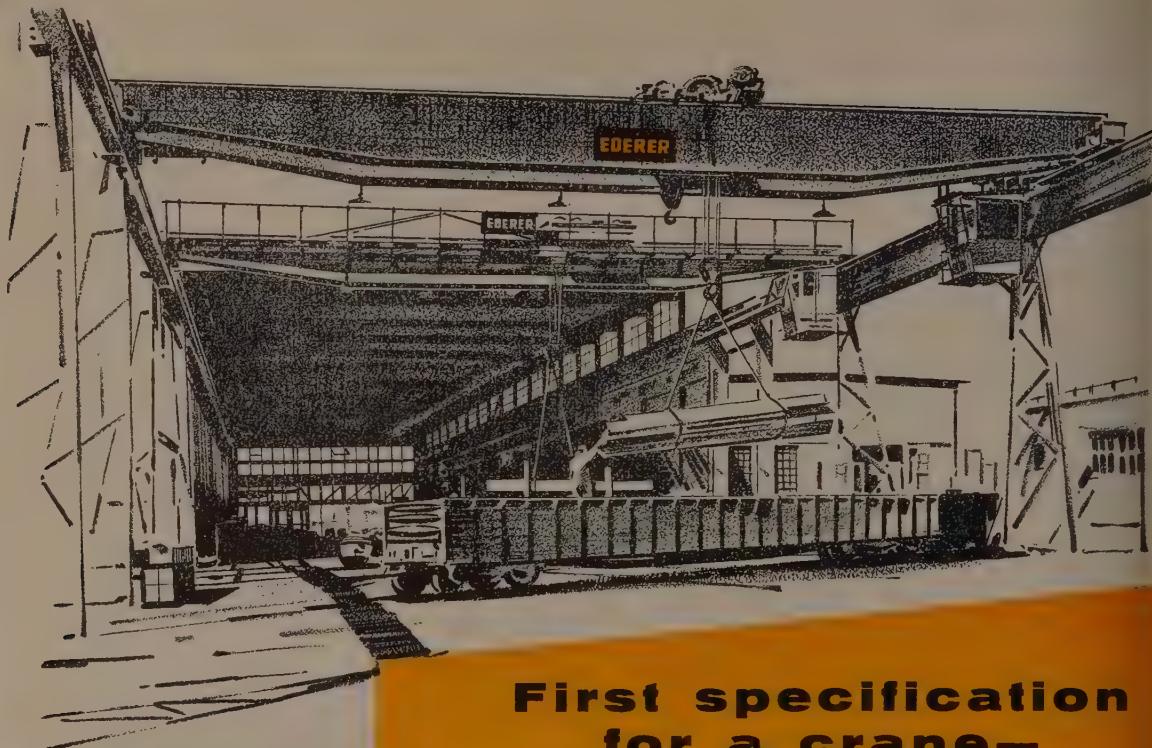
ROLLS—iron, alloy iron and steel  
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Auxiliary hoist unit has all reductions in one oil-tight case. All gears and quills are anti-friction bearing mounted.



Large size spherical roller bearings in MCB type wheel mounting; wheel and bearing easily removed. Rotating axle is coupled direct to bridge shaft drive.

When an EDERER engineer talks about a crane with you—foremost in his mind are your exact materials handling requirements—loads to be moved—span—runway length—operating speeds—any special conditions peculiar to your plant. With this information, EDERER “job-engineers” a crane to these exact requirements. Also—every EDERER crane is heavy-duty construction throughout—with oversize parts—plenty of safety margin—most efficient operating speeds. Then—on the job—your crane delivers capacity performance—with minimum maintenance—lowest cost-per-ton handling. EDERER can “job-engineer” a crane to your specific requirements. Why not send for the new EDERER crane catalog—Bulletin CR-610?

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**CRANES**



## EXPOSITION

TUESDAY, APRIL 27

### 9 a.m. Arena Conference Room

Convention Hall

#### Clever and More Automatic Ways of Holding All Work Materials

whether they are ferrous or nonferrous . . . whether you want to make a few passes or use 1,000,000 holes an hour

Magnetic Holding of Ferrous and Nonferrous Materials (22T9) —J. F. Manting, president, Hanchett Magna-Lock Corp.

(10:00) Jig Design for Multiple Automatic Operations (22T10) F. G. Zagar, vice president and general manager, Zagar Tool

### 9 a.m. Room 300

Convention Hall

#### Advanced Developments in Induction Heating

How to keep metal temperatures under close control with reduced capital, tooling and power costs

Process Applications for Dual-Frequency Induction Heating (22T11) —R. S. Segsworth, director of research, General Engineering Co.

High-Production Tooling for Induction Heating (22T12) —P. N. Sorenson, chief test engineer, and G. E. Glick, production engineering manager, Tocco Division, Ohio Crankshaft Co.

### 1:30 p.m. Arena Conference Room

Convention Hall

#### How To Automatize Your Production with Special Machines

Whether it's complete machining of an engine block, producing a finished cigar or tying a tie without hands!

How to Plan a Transfer Machine (22T13) —D. E. Hawkinson, vice president, Hine Tool Sales, Greenlee Bros. & Co.

Creativity in Mechanical Design (22T14) —H. A. Oldenkamp, director of engineering and L. Strauss, project manager, General Engineering Laboratories, American Machine & Foundry Co.

### 1:30 p.m. Room 300

Convention Hall

#### Best Applications for Different Mechanical Assembly Techniques

How to join metallic or nonmetallic materials and elements more rapidly, with only moderately skilled labor and less expensive equipment

Changing Trends in Mechanical Fastening (22T15) —W. C. Stewart, technical advisor, Industrial Fasteners Institute

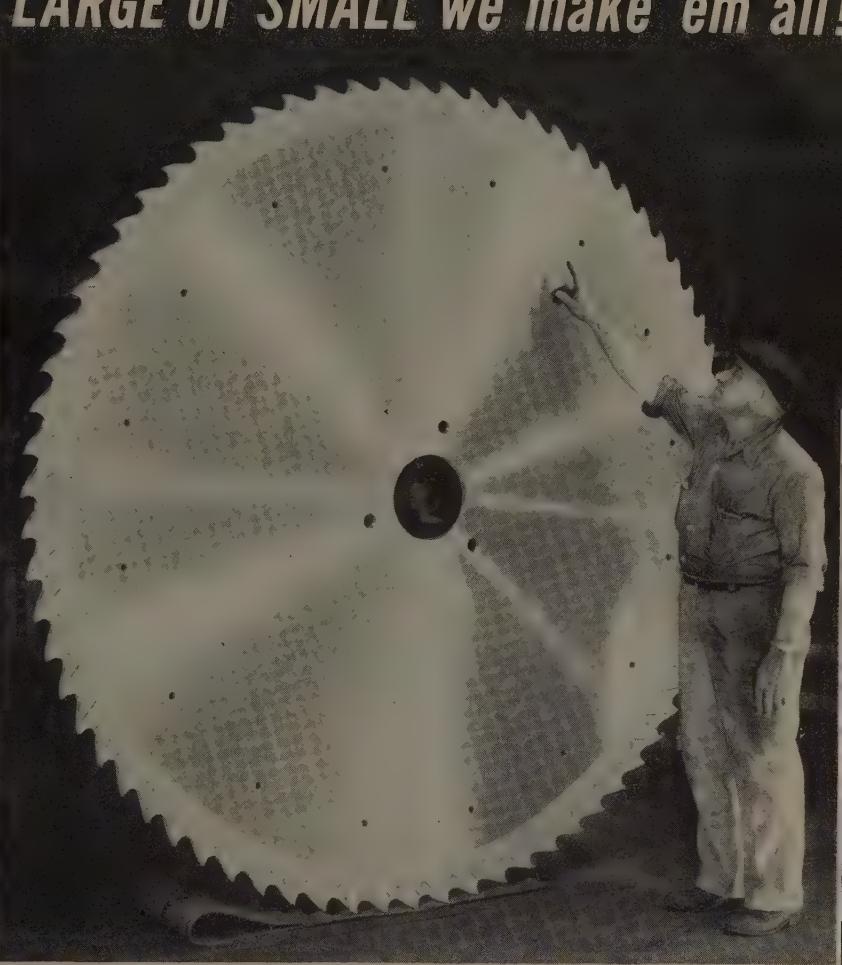
Fastening Techniques for Small Embosses (22T16) —V. L. Bradford, vice president in charge of sales, Milford Rivet & Machine Co.

### 3 p.m. Ballroom

Convention Hall

#### Why and How of Better Tooling for Automatics

There is almost always a better way to do it, whether on screw machines, turret lathes, or single or multi-spindle automatics. You want to improve your production tooling. Let this panel help. It has both the equipment and the manufacturing know-how



## Buy ATKINS Silver Steel®

### ...SEGMENTAL OR SOLID TOOTH...AND GET:

- Top Quality Steel in Every Size, for Every Job!
- Faster and Smoother Cutting.
- Longer Cutting Life between Sharpenings.
- Solid Tooth—up to 22" Diameter from Stock.  
—up to 36" Diameter on Order.
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—up to 96" Diameter on Order.

... and for your smaller jobs, for slitting and milling, your best choice is Atkins Solid Tooth Metal-Cutting Saws. They're Silver Steel, of course, with a tooth shape for every job . . . and Curled Chip cutting for fast, free feeding and cleaner, truer cuts every time!

### WHAT SIZE DO YOU NEED?



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ATKINS SAW DIVISION - BORG-WARNER CORPORATION

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**Gulf**

**Oilcoat T**

prevents rust in lubricating systems  
but does not contaminate lubricating oils

The compatibility of Gulf Oilcoat T with lubricating oils is of particular importance to you if the lubricating systems of your new machines are flushed with the same oil that is to be used for lubrication.

The use of a rust preventive that is not compatible may result in the development of harmful precipitates in the lubricating oil and considerably shorten its period of usefulness. Oils so contaminated may even cause machine parts to be damaged, thus increasing maintenance costs.

Several large machinery manufacturers have thoroughly tested Gulf Oilcoat T. They now use it extensively to protect the vital lubricating systems of their equipment against rust during shipment and installation.

Because of its light viscosity, Gulf Oilcoat T may be applied by spray, brush, dipping, or circulation.

If you manufacture, ship, store, or seasonally shut down machinery that has a lubricating system, ask a Gulf Sales Engineer to explain in more detail the advantages of Gulf Oilcoat T. Contact your nearest Gulf office now, or send the coupon below.

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# ...How about Malleable?

## Reduce Machining Time and Cost Increase Product Durability

Malleable iron machines easier than any other ferrous metal of comparable strength and toughness. It can be cast into intricate shapes close to final form, greatly reducing machining. Malleable often can be further formed by press or coining operations and holes punched instead of drilled.

Take advantage of malleable's machinability, ductility, resistance to shock and corrosion when designing new products or looking for ways to cut costs on current production. Call a malleable foundry and go over your products with their engineers. Find out how malleable can improve your products and save money.



**Automotive  
Differential Case**

Because of malleable's remarkable machinability the  $7\frac{5}{8}$ " flange on this casting is turned at a rate of more than 125 parts per hour. Carbide tools are used with water as a coolant. Tool life averages 18 to 20 hours per grind.

Send for "Malleable Iron Facts" useful information on Malleable iron properties and uses.

Just write to . . .

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FOUNDERS' SOCIETY



1200 Union Commerce Building

Cleveland 14, Ohio

10. Tooling for Automatics  
(Panel Discussion):

J. L. Anderson, chief tool estimator  
Gisholt Machine Co.  
J. S. Brozek, supt., Tooling Division  
Sargent & Co.  
E. L. Ketter  
Jacobs Mfg. Co.  
F. J. McArthur, chief tool engineer  
James & Lamson Machine Co.  
T. H. Olson, chief tool engineer  
Yale & Towne Mfg. Co.  
J. Prohaska, vice president  
Cleveland Automatic Machine Co.  
W. H. Spence, sales director  
Brown & Sharpe Mfg. Co.

### 8 p.m. Ballroom

Bellevue-Stratford Hotel

### New Techniques and Possibilities for Castings

When can castings replace forgings for stressed structures? What about shell molding for small-scale as well as large-scale, automatic equipment?

11a. The Possibilities for Castings in Airframe Design (22T17)—A. H. Petersen, design group engineer, Lockheed Aircraft Corp.

11b. (9:00) Automation of Shell Molding (22T18) L. J. Bishop, vice president and director of engineering, Mechanical Handling Systems Inc.

### 8 p.m. Burgundy Room

Bellevue-Stratford Hotel

### Industrial Penetration of Atomic-Fission Discoveries

Possibilities of atomic by-products in wear studies of tools, dies, gears and bearings . . . the detection of incredibly minute amounts of undesired elements in metals . . . plant production control through use of depth and thickness gages . . . non-destructive testing . . . locating of raw materials such as piped liquids and plant effluents

12. Nucleonics Invade the Tool Engineering Field (22T19)—L. S. Goldring, radioisotope Nuclear Development Associates Inc.

### WEDNESDAY, APRIL 28

#### 9 a.m. Ballroom

Convention Hall

### Best Approaches to Internal Milling and Jigless Boring

Pantographic milling is now available with single or multiple-spindles, with two or three dimensional tracers, at speeds to 45,000 rpm. Ultra-maintained precision demands removal of manual variables; automatic work position and tool lock and release help achieve this end

13a. Tracer-Controlled Pantographic Milling (22T20)—A. D. Gunderson, assistant chief engineer, George Gorton Machine Co.

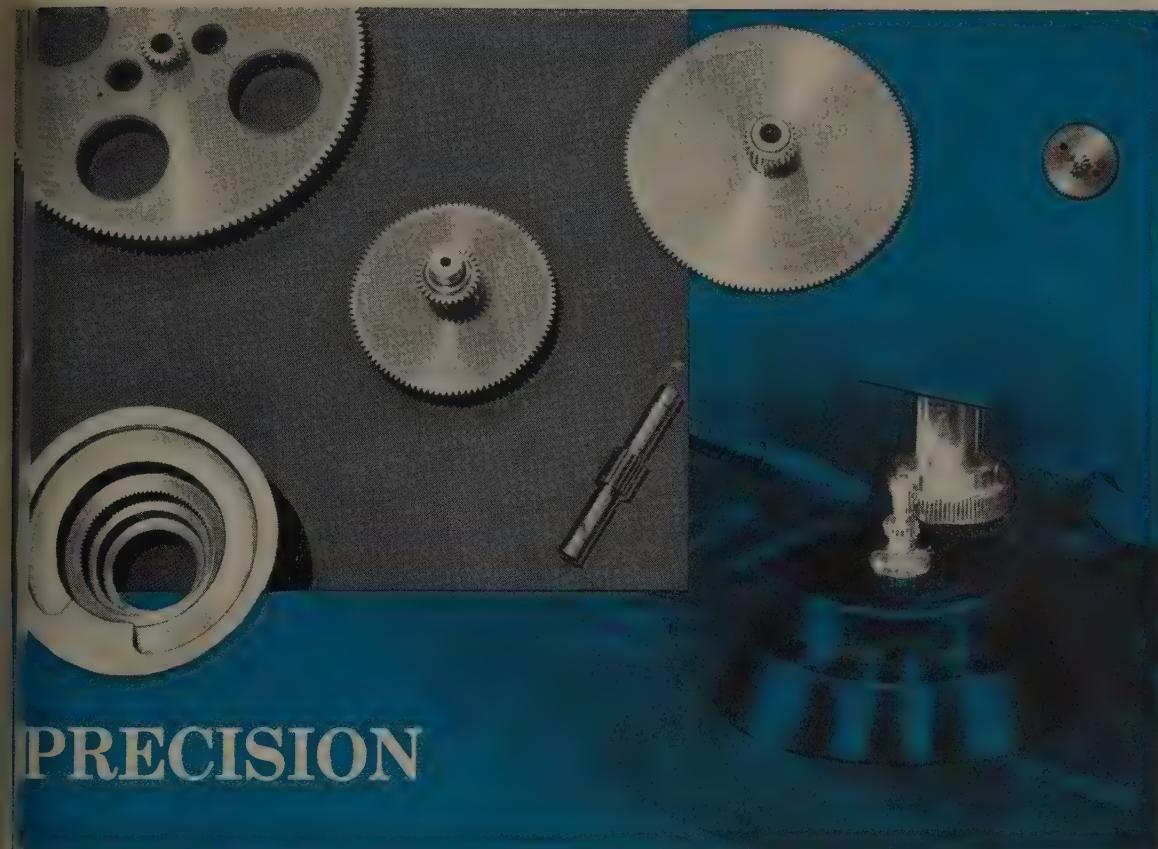
13b. (10:00) New Arts in Jigless Boring (22T21)—C. B. DeVlieg, president, DeVlieg Machine Co.

#### 9 a.m. Room 300

Convention Hall

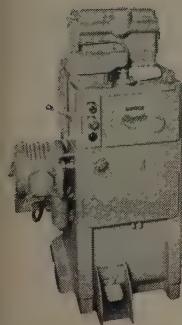
### How to Prepare For and Secure Superior Metal Surfaces

Either by heating parts in special powder compounds . . . or by metal blasting for subsequent finishing. In the latter case, much versatility is achieved through use of the proper metallic or nonmetallic abrasive

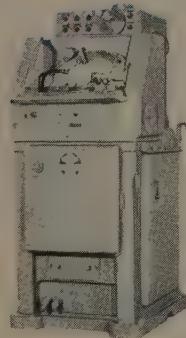


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Quality Control Tool up  
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*Small Gears, too, can be economically produced on Fellows equipment. The accuracy demands for tiny gears and pinions for the 'electronic age' are being met with tolerances in the low tenths of a thousandth of an inch (that's .0002" for example).*

The proof is in the production records of the machines shown at left, used with Original Fellows Cutters and Shaving Tools. We'll be glad to quote some outstanding examples on small gears similar to your requirements. There's a Fellows Representative with the facts at the sales office near you.

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## EXPOSITION

Chromate Conversion Coatings (22T22)—W. Ostrander, service manager, Allied Research Products Inc.

Metal Blasting and Finishing with Air-Blast Equipment (22T23)—F. W. Pedrotty, director of application engineering, American War Laboratory & Equipment Corp.

### a. m. Arena Conference Room

Convention Hall

Plastic Postforming; Improved Investment Casting Design and Control

Postforming of Thermoset Plastics (24)—St. John Bain, project engineer, Fibreco Co. (Low-pressure thermoelastic forming of laminate sheets frequently permits interchangeability of press tools for metals and plastics; can be inexpensively produced in low volume.)

(9:45) Improved Design and Dimensional Control for Investment Castings (25)—R. L. Wood, president, Arwood precision Casting Corp. (Variables can be tricky; w/ plastic, ceramic mold material and metal as are physical variables; same is true of the product design; but variation ranges can be established.)

### 30 p.m. Arena Conference Room

Convention Hall

Adv Concepts in Abrasive-Belt Grinding

How to sharpen tungsten carbide tool bits to finish of 2 to 16 micro-inches rms . . . hold required accuracy of angles . . . 1 to 3 cents per tool. You can now automatically generate concave forms, like turbo blades, as well as extremely convex forms, by cam grinding.

Abrasive-Belt Grinding of Carbide Tools (27)—E. E. Oathout, products engineer, Manning Corp.

Hydraulically Cammed Profile Grinding (22T28)—A. F. Alt, chief engineer, Planet Products Corp.

### 1:30 p.m. Room 300

Convention Hall

C versatile Manufacturing Uses of Heat and Cold

On the hot side, simple to complex metal parts can be flame-cut with the electric eye. The cold side, sub-zero chilling down to 50° F is now highly efficient for stabilizing materials, testing materials, shrink fitting and fitting perishable tools.

(a) Flame Cutting by Electronic Tracing (29)—R. F. Helmkamp, machine cutting specialist, Air Reduction Sales Co.

(b) (2:15) Sub-Zero Chilling As An Industrial Process (22T30)—R. S. Jamison, assistant to the president, Sub-Zero Products

### 3 p.m. Ballroom

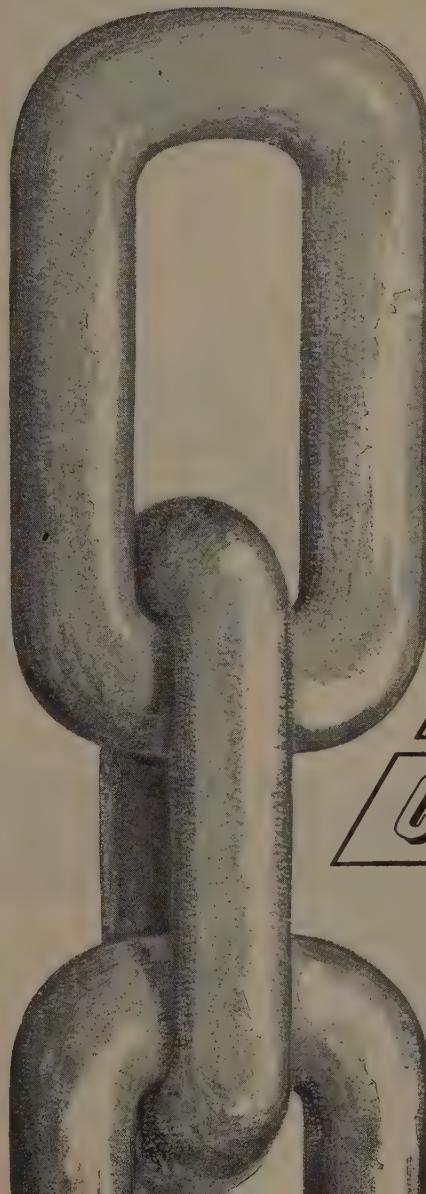
Convention Hall

Solutions for High-Speed and Difficult Machining Applications

Now ultrasonic machine tool developments enable you to cut just about anything with a diamond. How hobbing production has increased . . . on SAE 9310 gears, for instance, it's upped from 100 to 275 sfpm . . . and from 4 to 24 hobbed gears per hour . . . all with 50 per cent increased tool life.

(a) Ultrasonic Tools for Hard-to-Machine Materials (22T31)—J. P. Aloisio, applications engineer, Research Division, Raytheon Mfg.

# is this the MISSING LINK?



**Strong link in your production chain can be a Conco Crane—custom-designed for a specific need. Conco Cranes are available in the capacity you need, the right lift, the right speed, the right clearances to serve a given station faster, at less cost, with less manpower. Conco Cranes are backed by 36 years experience in the design of cranes, hoists, trolleys. Write for Bulletin 3000A illustrating and describing the Conco line.**

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Conco Building Products, Inc., Brick, Tile, Stone

# Why stop AUTOMATION at Assembly?

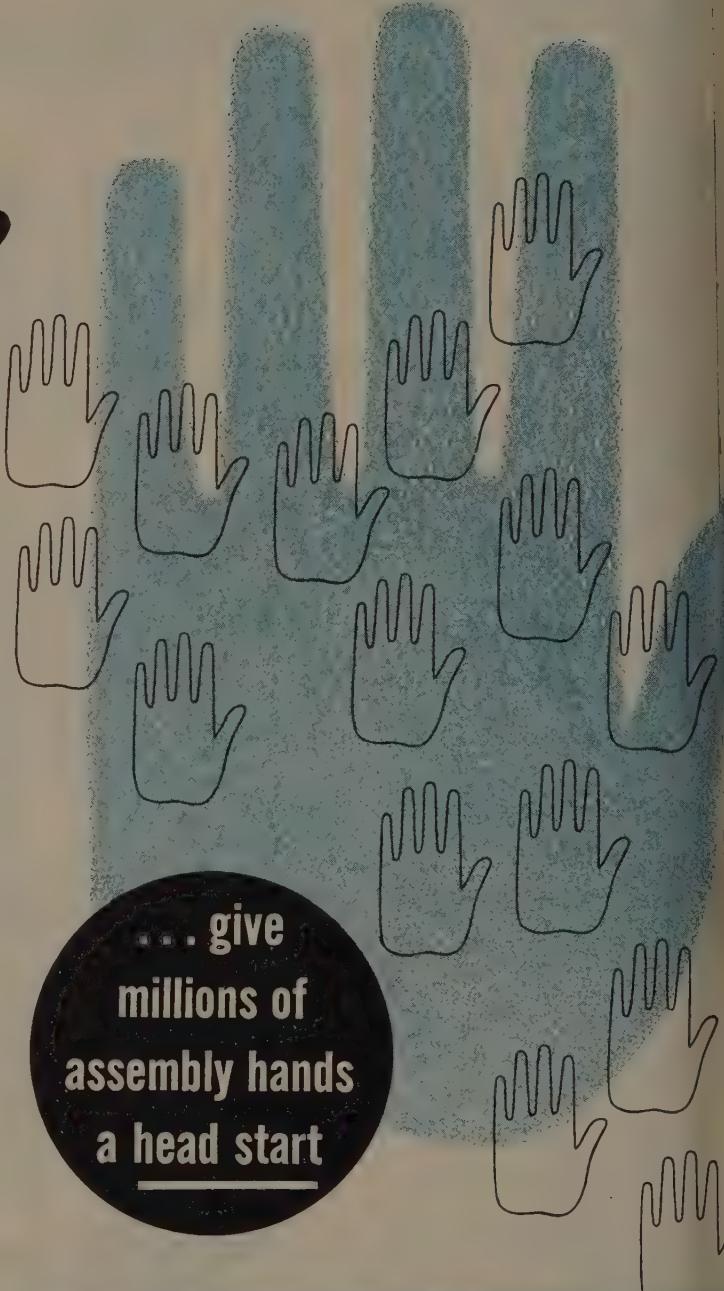
Automation is a new name for an objective long pursued by industry's keenest minds. It means successive elimination of manual operations.

In the production of metal or plastic component parts — by machining, molding, etc. — automation has made advances that in some cases seem almost magical.

By contrast, *assembly* often plods along slowed by outdated methods.

Progress toward automation *does not* end where assembly begins for manufacturers who take full advantage of the P-K Fastening Method. They *eliminate* manual operations like tapping, nut-running, inserts in plastic — and avoid the attendant trouble and expense. Automatic screw driving equipment can be used to further mechanize hand operations on many applications. Savings run up to 50% and more.

Complete automation is, for most, a *distant* dream. Meanwhile, assembly *hands* control your fastening costs. Find out how P-K Self-tapping Screws can *double* — *even triple* — their efficiency. It *pays* — and pays well — *today*. Talk to a P-K Assembly Engineer. Parker-Kalon Division, General American Transportation Corporation, 200 Varick St., New York 14.



## PARKER-KALON



A



Phillips  
A



Z



Phillips  
Z



Hex Head

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... see your nearby P-K Distributor

**Automatic Driving** adds extra speed to the faster P-K Fastening Mod. Here, an automatic, double-spindle, hopper-fed machine is being used for driving two P-K Type U Drive Screws simultaneously in a plastic electric outlet. Single or multiple spindle machines are available from several manufacturers.



**MAYTAG ASSEMBLY MOVES FASTER** because fastenings made with P-K Self-tapping Screws are simpler, easier, dependably secure. In the Maytag Dryer shown, 80 Type A and 46 Hex Head Type Z are used, in all, for fastening sheets from 24 to 11 gage — driven with air-operated tools.



**with P-K quality-planned assembly savings pay off**



**TELEREX RELIES ON PROVED STRENGTH** of P-K Self-tapping Screws for this critical fastening in an outboard motor sub-assembly, where lasting security is vital. A P-K Binding Head Type F is driven through a die-cast aluminum drive housing and acts as a retainer for the stamped aluminum exhaust baffle.



**TELEREX GETS CLEAR PICTURE** of performance. For this "Hi-V" Reflector, Telerex, Inc., needed proved resistance to high tension and vibration. They specified 17 slotted Hex Head Z, reasoning soundly that P-K, the *originator*, knows best how to put uniform hardness and toughness in *every* screw.

## *The Original* SELF-TAPPING SCREWS



F-Z



U



21



SCREWNAIL



MASONRY NAIL



Technical Supply and Service Specialist



## EXPOSITION

18b. (4:00) Hobbing at High Speeds and Heavy Metal Removal (22T32)—J. W. Rapp, superintendent of gear manufacturing, Ohio Axle & Gear Division, Rockwell Spring & Axle Co.

### 8 p.m. Burgundy Room

Bellevue-Stratford Hotel

### Advantages in Parting and Extruding Cold Steel

In the nick-and-break method of parting, you can get faster production of square-

end blanks without crystalline distortion. With correct die design, cold extrusion can now give you finished shapes to closer tolerances with glass-smooth surfaces, eliminating subsequent machining except threading.

19a. Shear-Fracture Parting of Steel Billets (22T33)—W. C. Tucker, chief engineer, Buffalo Forge Co., Machine Tool Division

19b. (9:00) Successful Design of Steel Parts for Cold Extrusion (22T34)—D. I. Brown, Market Development Manager, Mulline Mfg. Corp., Koldfllo Division

### 8 p.m. Ballroom

Bellevue-Stratford Hotel

### How to Lick Your Tough Milling Problems

A group of internationally known specialists has set up an agenda, with opportunity for all present to participate to answer the most vital questions on the subject.

20. Clinic on Improved Milling Practice

### Panel Discussion:

W. A. Coe, sales engineer, Nelco Tool Co. Inc.; J. Daugherty, consultant, Giddings & Lewis Machine Tool Co.; Dr. Horace Frommelt, staff consultant, Detroit Milling Cutter Co.; K. B. Kaiser, assistant chief engineer, Ingersoll Milling Machine Co.; E. J. Krabacher, research engineer, Cincinnati Milling Machine Co.; J. R. Roubik, assistant research engineer, Kearney & Trecker Corp.; T. G. Vickers, master mechanic, Clark Equipment Co., Transmission Div.

## THURSDAY, APRIL 29

### 9 a.m. Arena Conference Room

Convention Hall

### Cutting Fluids and Methods for Machining Difficult Materials

How to pick the right cutting fluid with greater speed and certainty . . . what has been learned in the last year and a half about cutting and forming titanium.

21a. An Orderly Use Classification of Cutting Fluids (22T35)—R. G. Moyer, group engineer, Pure Oil Co.

21b. (9:45) What's Known Today About Machining Titanium (22T36)—G. T. Fraser, sales manager, Rem-Cru Titanium Inc.

### 9 a.m. Ballroom

Convention Hall

### Parts Design for Cold Pressure Welding

Proper parts design, tooling and pressure can insure full-strength molecular cold-welding of similar or dissimilar ferrous and nonferrous metals; simple tools require special skilled labor.

22a. Preparation and Tooling for Cold Pressure Welding (22T37)—W. A. Barnes, vice-president, Engineering and Production Division, Utica Drop Forge & Tool Corp.

### 10 a.m. Ballroom

Convention Hall

### Extending Industrial Plant Layout to Take on Depth

How three-dimensional color-coded layout planning can help you visualize even the most complex future plant.

22b. Visualizing Plant Layout in Three Dimensions (22T38)—H. H. Dasey, president, Visual Plant Layouts Inc.

### 1:30 p.m. Arena Conference Room

Convention Hall

### How Integrated Automation Can Revolutize Production Patterns

How to apply automation to conventional equipment. Examples: the automatic piston factory and the National Bureau of Standards' brand new "Project Tinkertoy." Its implications must challenge everyone involved in equipment manufacture, production of fabricated products and those who deal with personnel training and personnel relations.

23. The Challenge of Automation (22T39)—John Diebold, management consultant

### 1:30 p.m. Ballroom

Convention Hall

### The Latest Fixture Assembly and Inspection Tools

How to use optical tooling for fixtures. Also, new data on standardized gaging cartridges and other new concepts of gaging and inspection now available to industry.

24a. Optical Tooling for Fixture Construction (22T40)—R. E. Stegier, engineer, Manu-

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► To your specification or ARDCOR design  
—for all makes of roll forming machines

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...because we can prove *which* cleaner is right. That's the catch—and that's why H-VW-M cleaners do the best cleaning job. You see, with our complete facilities we'll prepare samples, apply compositions, buff, try various cleaners—even plate to compare final results. When we've finished... duplicated every process and test that a manufacturer will use... we know we've got the right cleaner.

And *all* H-VW-M cleaners—whether they're for standard or special applications—have to meet our high standard of purity

under rigid quality control. Soak or electro cleaners, specific purpose cleaners such as acidic types and aluminum etchants—custom made cleaners for special jobs—all combine to make available the most complete line of cleaners in the plating industry.

This is all a result of H-VW-M's constant progress for more than eighty years. We call it *Platemanship*—our seal of quality that's your guarantee of getting the best that industry has to offer, not only in cleaners, but in every phase of plating and polishing.

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right cleaner...*



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# H-VW-M

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## EXPOSITION

uring Research and Development Section, public Aviation Corp.

26b. (2:15) New Concepts of Gaging and Section (22T41) — W. I. Wilt, assistant manager, Sales Division, and Harry Kiefaber, application engineer, Sheffield Corp.

### 3 p.m. Ballroom

Convention Hall

### W to Improve Your Inspection Ways and Means

quipment, operation and supervision are represented by a panel of authorities, then your problem lies in the control of quality, manual or automatic gaging, or non-destructive testing.

#### 5. Inspection Ways and Means

(Panel Discussion)

P. G. Fishback, manufacturing engineer, Accessories Div., Thompson Products Inc.; J. Manuele, director of headquarters, Quality Control, Westinghouse Electric Corp.;

F. Meyer, Jr., chief engineer, Taft-Petco Mfg. Co.;

F. B. Murphy, field manager, Johnson Gage Co.;

S. D. Nicolas, chief inspector, Merz Engineering Co.;

E. C. Polidor, chief engineer, Optical Gaging Products Inc.;

G. H. Stimson, gage sales manager, Greenfield Tap & Die Corp.

### 7 p.m. Ballroom

Bellevue-Stratford Hotel

### nd Annual Banquet of the American Society of Tool Engineers

Speaker: Dr. Henry T. Heald, chancellor, New York University

Note: For Banquet Reservations at \$7.50 per person, send your check directly to the American Society of Tool Engineers, Detroit

### FRIDAY, APRIL 30

#### 9 a.m. Room 300

Convention Hall

### hat the Tool Engineer Needs to Know About Powder Metallurgy

Why and when powder metallurgy may be the best answer to better product design and styling

26a. Product Design For Powdered Metals (22T42) — G. Stern, vice president and technical director, American Electro Metal Corp.

26b. (10:00) Tooling for Powdered Metals (22T43) — J. F. Kuzmick, consultant, Ealed Carbide Tool Co.

### 9 a.m. Arena Conference Room

Convention Hall

### ow Plastics Are Moving Into Full-Scale Production

For jigs, plastics provide structures which are exceedingly sturdy, strong and dimensionally stable; lighter than aluminum; easier



## You Get Economical, Quick, Secure Fastening with Townsend Tapping Screws

You enjoy the economy of quality when you use Townsend tapping screws. They are made to provide an easy method of securely fastening metal, plastics, wood, asbestos and compositions with efficiency.

The use of Townsend thread forming screws eliminates costly tapping operations as the precision-rolled thread forms a mating thread when the screw is driven into the material. They are widely used in sheet metal, castings, and a variety of non-metallic materials. They may be removed and replaced without impairment of their holding power.

Townsend thread cutting screws have an off-center slot which presents a true, sharp, thread-cutting face which acts as a tap when the screw is driven into an untapped hole. By cutting their own threads, these screws fit tightly and resist loosening

from vibration. There is no chance of size discrepancy between screw and tapped hole.

Townsend tapping screws are available in the types shown here in a variety of head styles with slotted or Phillips recessed and hex heads. They are but one group of the Townsend family of 10,000 types of standard and special fasteners and small parts used by all industry to improve assembly and speed production.

As representatives of "The Fastening Authority" Townsend engineers can draw upon 138 years of accumulated experience in wire drawing and cold forming to help solve your fastening problems. You can depend upon Townsend to give you excellent service in any quantity. For additional information on the economy of using Townsend tapping screws, send the coupon below or write.

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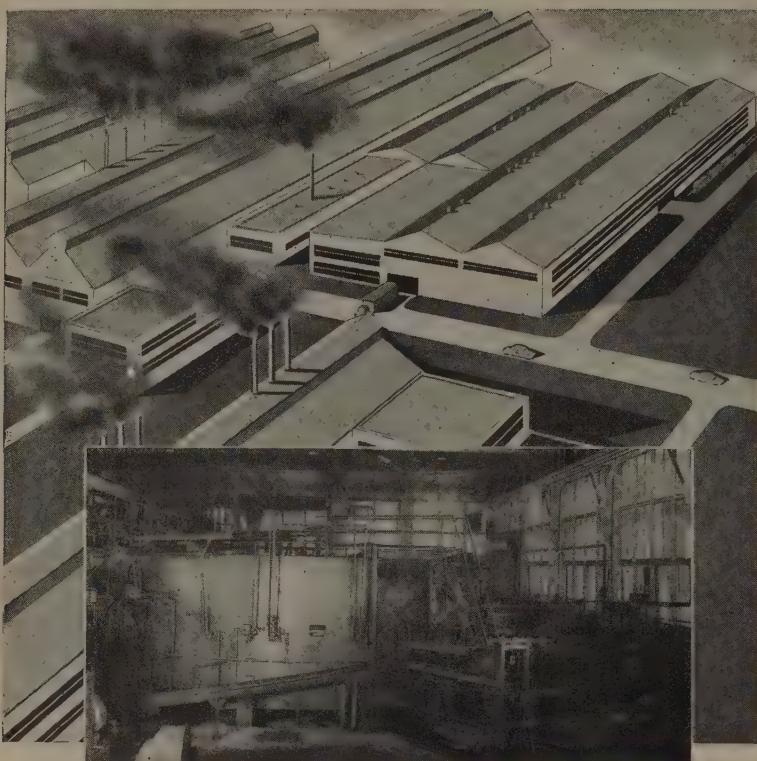
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to fabricate than steel. For dies, it's quick and easy to make duplicates which can easily produce thousands of pieces. Results of several road tests of plastic auto bodies. Are mass production techniques just around the corner?

27a. Plastic Fixtures Have Wide Use (22T48)—B. Sokol, plastic engineer, Republic Aviat. Corp.

27b. (9:45) Plastic Dies Move Into Regular Production Service (22T45)—G. C. Adam staff engineer, Rezolin Inc.

27c. (10:30) Plastic Auto Body Developments (22T46)—W. A. Hermonat, technical representative, Naugatuck Chemical Division U. S. Rubber Co.

1:30 p.m. Room 300  
Convention Hall

### Newest Approaches to Your Welding Problems

How to weld and braze high-temperature materials such as stainless steel 347, cobalt alloy 25, and titanium. Where to use stud welding instead of drilling and/or tapping plate when a stud must be joined to it.

28a. Welding and Brazing of High-Temperature Materials (22T47)—F. H. Stevenson, production engineer, Aerojet-General Corp.

28b. (2:15) Ferrous and Nonferrous Stud Welding (22T48)—R. C. Singleton, industrial sales manager, Nelson Stud Welding Division, Morton-Gregory Corp.

1:30 p.m. Arena Conference Room  
Convention Hall

### Latest Techniques in the Forming of Sheet Metals

How industry can benefit from government research which has developed complete standardized tooling for stretch-wrap forming. You can now deliberately preform metal shapes to conquer the most difficult types of draw.

29a. Principles of Stretch Wrap Forming (22T49)—K. Drone, chief engineer, Hufford Machine Works Inc.

29b. (2:15) Planned Pre-Deforming of Shapes for Better Drawing (22T50)—C. M. Geddis, assistant master mechanic, Buick Motor Division, General Motors Corp.

3 p.m. Ballroom  
Convention Hall

### How Others Have Improved Their Workholding Ways and Means

One of the oldest, most basic responsibilities of the tool engineer is still as challenging as the diversity of the manufactured product themselves. Ask what you want of the pane concerning fixtures, jigs, chucks, collets and the like—whether mechanically, pneumatically, hydraulically, magnetically or otherwise actuated.

30. Workholding Ways and Means  
(Panel Discussion)

J. L. Balciunas, chief engineer, Skinner Chuck Co.;

L. R. Burger, sales manager, Logansport Machine Co. Inc.;

K. Cole, chief designer, N. A. Woodworth Co.;

J. I. Karash, production manager, Reliance Electric & Engineering Co.;

P. Lindhuber, chief tool designer, Spicer Mfg. Division, Dana Corp.;

R. W. Newton, tool analyzer, International Business Machines Corp.;

J. E. Rotchford, vice president, Lodding Inc.



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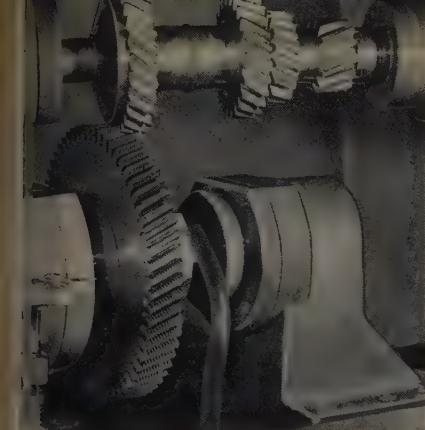
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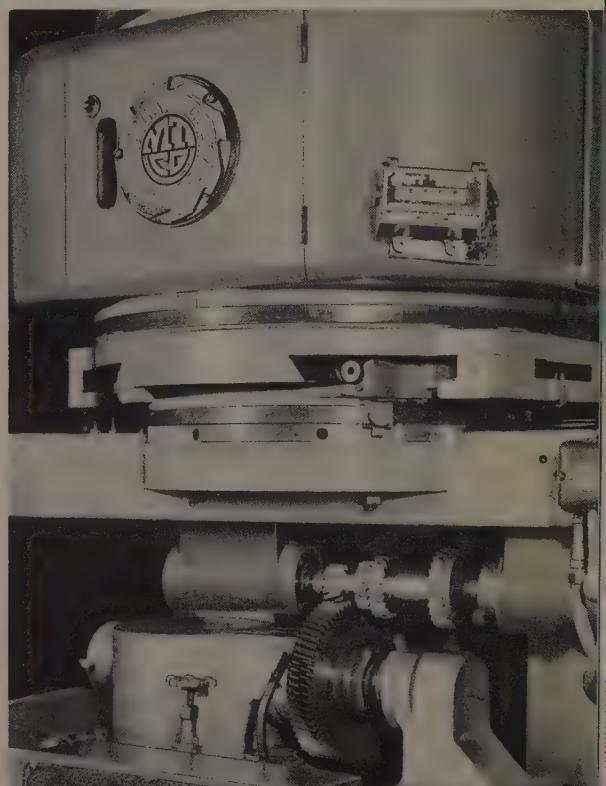
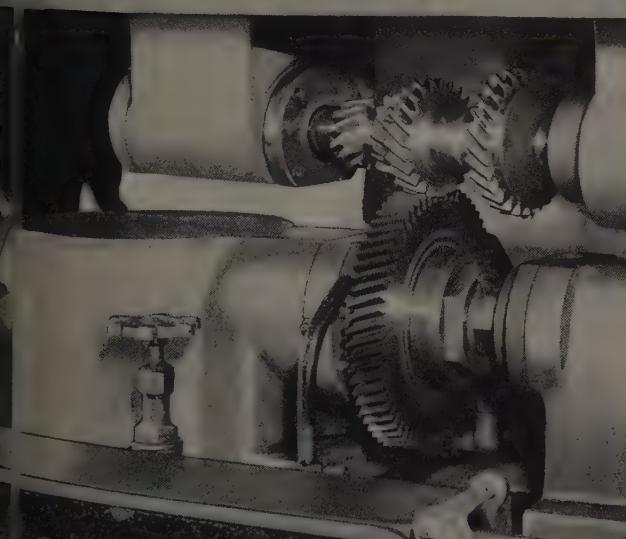
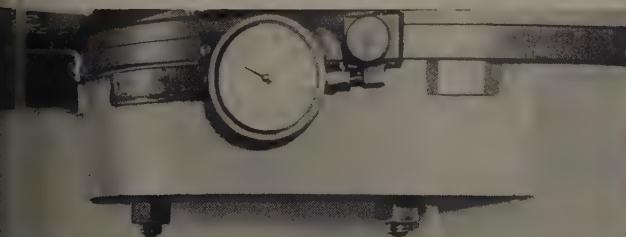
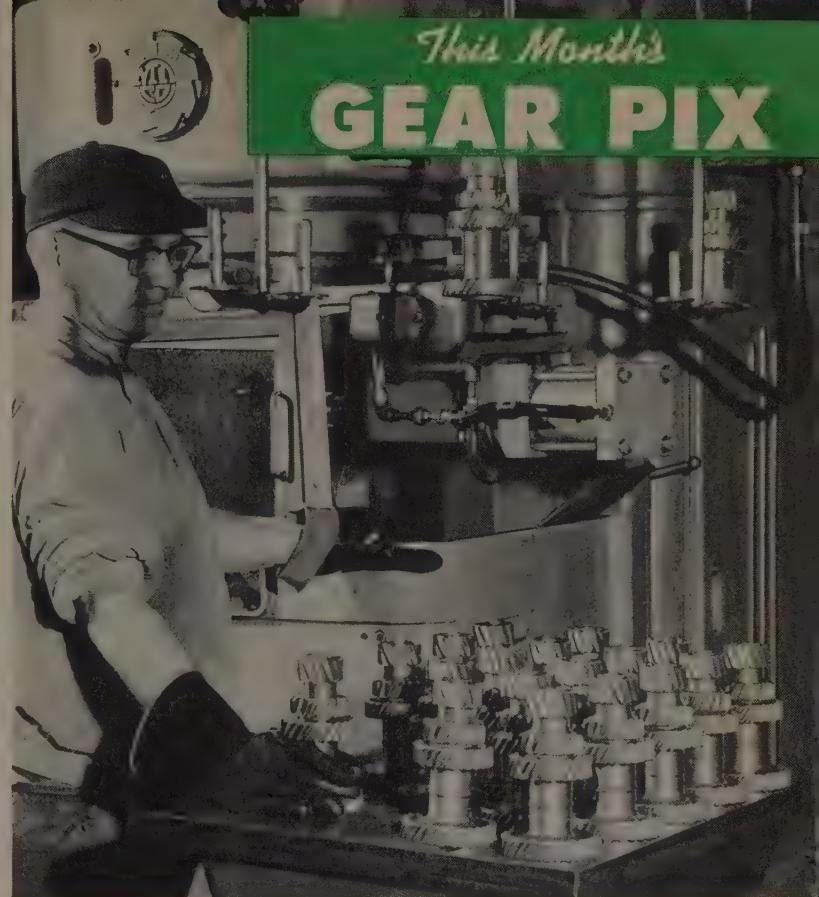


**HAVING**—A large battery of Michigan model 870 rotary gear finishers (each operator handles two or three machines) shaves the gear teeth on this standard transmission cluster in a Detroit automotive plant. Pneumatically actuated adaptors speed the loading operations.

*(above)*—Shaving cycle time on this 27-tooth cluster on the Michigan 870, using the modified underpass method, is 30 seconds.

*(lower left)*—This 23-tooth 3.253" diameter .65" face width intermediate gear on the cluster is finished in 24 seconds cycle time on Michigan 870 gear shavers by the modified underpass method.

*(lower right)*—Reverse gear on the cluster, 3-teeth, 8.25 pitch, .948" face width, is shaved by the underpass method on Michigan 70 gear finishers in 29 seconds.

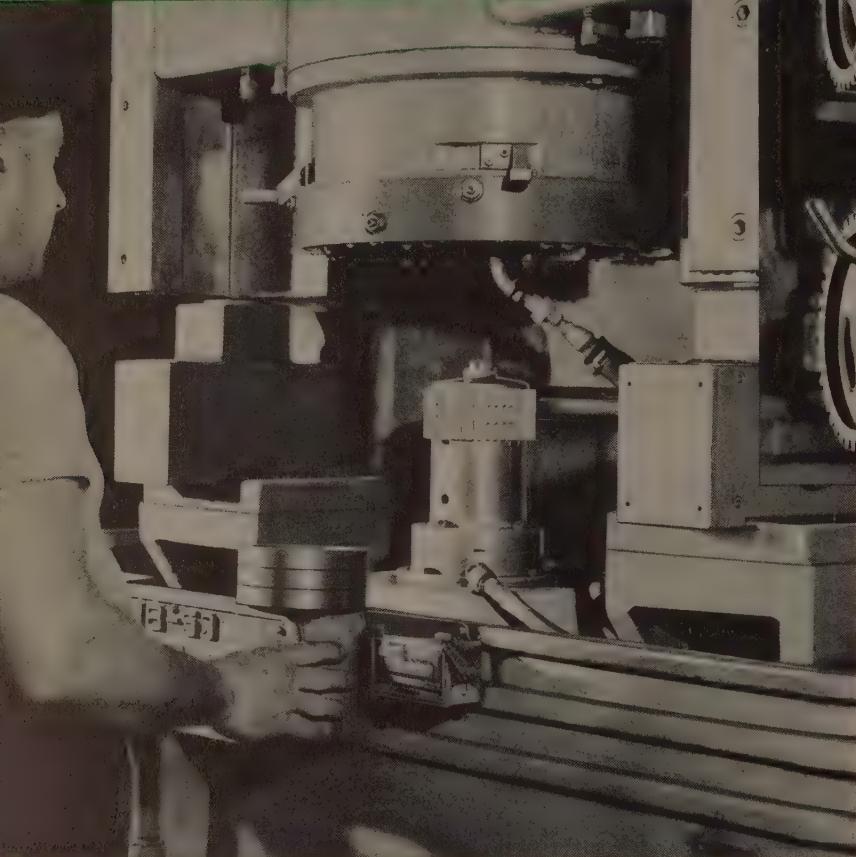


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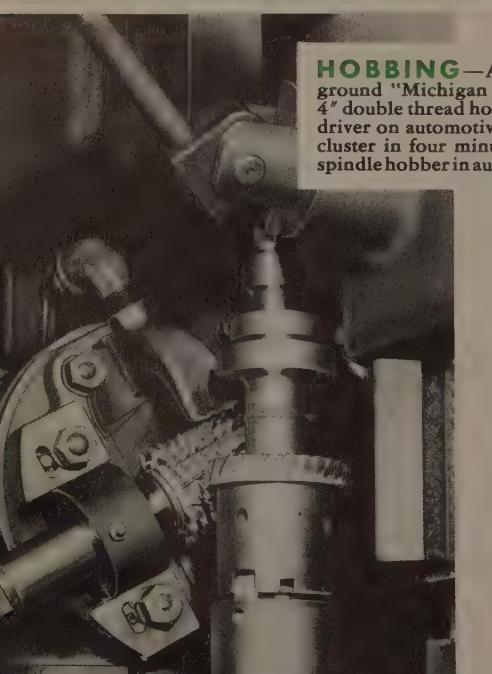
This Month's

# GEAR PIX



**SPROCKETS** — Two operators attending four Shear-Speed gear shapers, model 1853, cut teeth on 12 42-tooth cast iron camshaft timing gear sprockets (.5018" diameter-.76" face) in 53 seconds in one of the large Detroit automotive plants. Three sprockets are loaded on each arbor; hence, all the teeth on each sprocket are cut every 18 seconds—one tooth every .43 second actual cutting time on each of the respective machines.

On the four Shear-Speed gear shapers this results in one sprocket every 4.4 seconds; one tooth every 1/10 second.



**HOBBING** — Accurate unground "Michigan Process" 3" x 4" double thread hobs cut 27-tooth driver on automotive transmission cluster in four minute cycle on 8-spindle hobber in automotive plant.



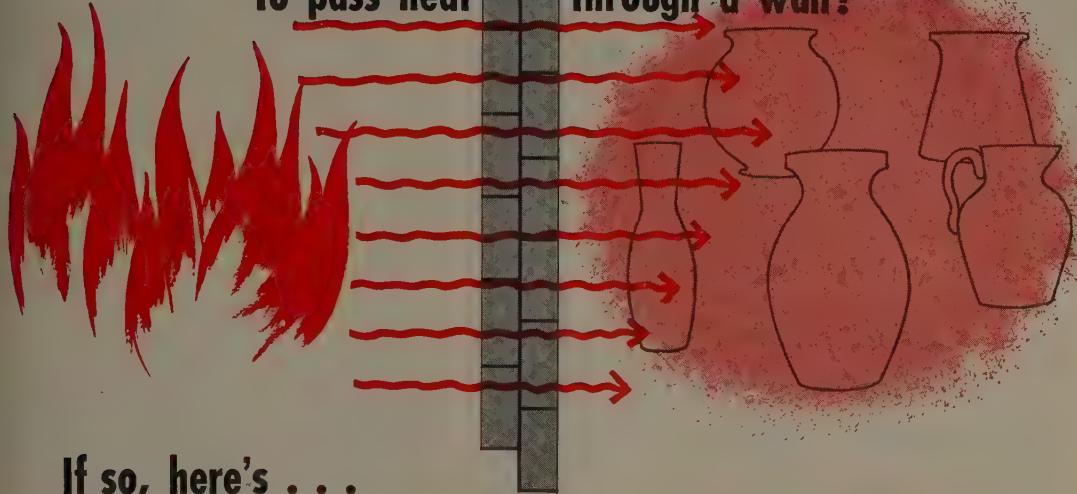
**SPEEDER** — Michigan model 1127-B tests automotive transmission clusters for quietness and tooth contact running in mesh with master gears at high speeds with brake loads applied.

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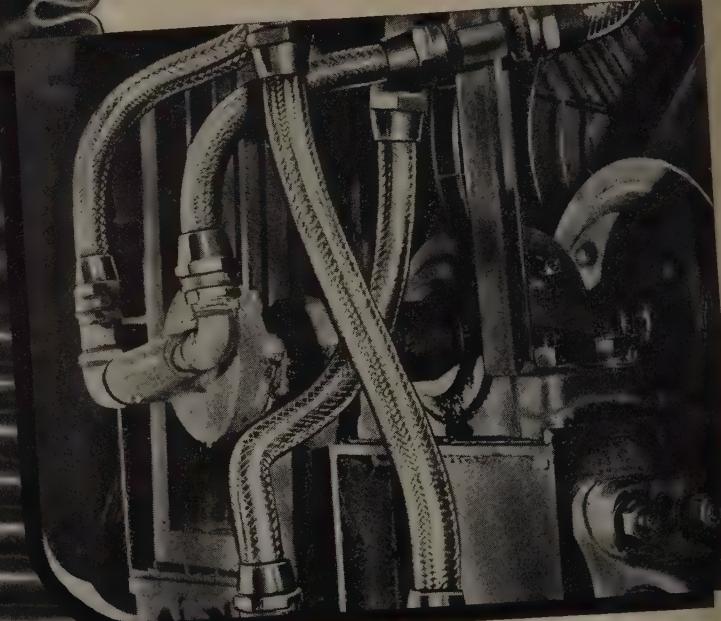
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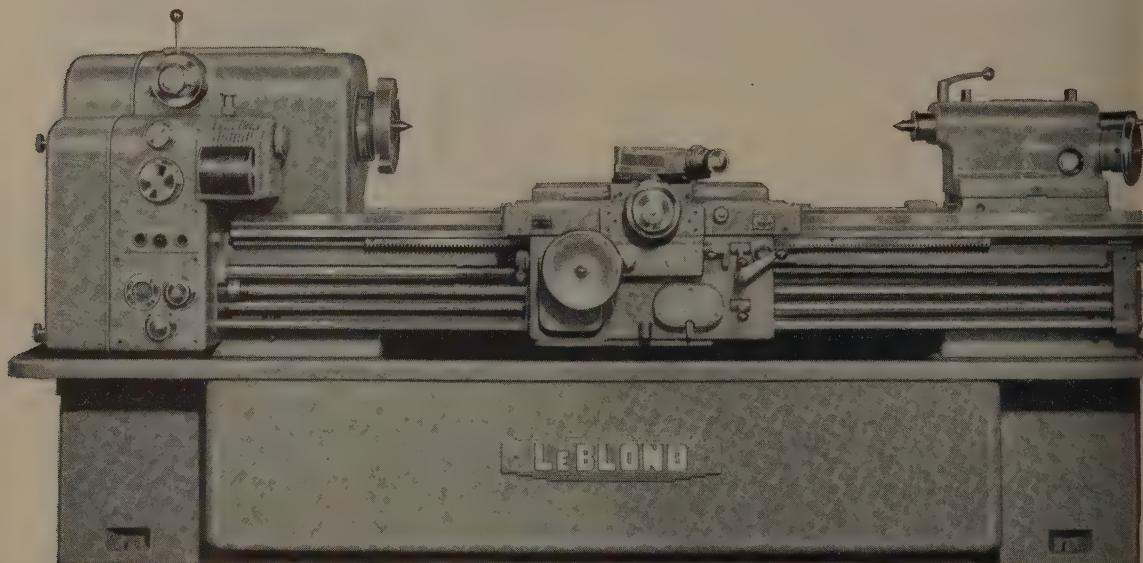
**Automatically Positioned Leadscrew and Rod Supports** perfected in 1923.



**A Universal Quick-change Box** with 90 feeds and threads in two ranges. You can cut from 120 threads to  $1/4$  thread per inch — without setting pick-off gears, mounting a sub-head or using any other attachment. Diametral pitch threads, leads in inches, millimeter leads and module pitch leads also can be cut by making a slight gear change. Put into production by LeBlond in 1937.



**Automatic Chasing Stop**, used primarily for cutting threads, limits cross slide travel positively and accurately. Makes possible speedy chasing, since cross and length power rapid traverse can be used to bring cross slide quickly back to exact starting position for each pass.



## Condensed RT Lathe Specifications:

Swing over bed and carriage wings	18 $\frac{1}{2}$ "	Feed and thread changes	60 regular 30 coarse
Swing over compound rest	11 $\frac{1}{2}$ "	Feeds, range	.0007-2.064 ipr
Distance between centers, base length	30"	Threads per inch, range	2-120 regular $\frac{1}{4}$ - $\frac{1}{8}$ coarse
Spindle speeds, range, rpm		Floor space required	96" x 48"
Low back gear	6 to 60		
High back gear	30 to 300		
Direct belt drive	150 to 1500		

# had today's Most Wanted Features

Advancements set the standard for lathes today.



**RT Combined Feed Apron with built-in Taper Attachment** achieved in 1939. Cuts gradual or steep tapers with the larger dimension either towards the tailstock or headstock—without special machine set-ups.



**An Exclusive Off-set Handwheel Tailstock** employing a worm-and-rack construction for positive-position locking, greater operator convenience plus Hollow Tailstock Spindle adaptability. Equipped with a direct-reading spindle travel indicator.



And in 1946, the **Variable-voltage Speed Control** was incorporated into the head to provide over 300 spindle speeds in three ranges controlled by a single lever.

After five years in development and four years of on-the-job testing in LeBlond's production line, Industry met for the first time the 16" RT Tool Room Lathe at the 1947 National Machine Tool Show. There the RT's spectacular features—far ahead of their time—caused a flurry of comment about its amazing versatility. This lathe could do almost anything.

Only within the last few years have tool engineers throughout the lathe industry built into their lathes those features of the LeBlond RT Lathe that were

"new" back in 1935 . . . in 1937 . . . in 1941 . . . in 1946. Features that made the RT Lathe famous for the ability to handle almost any job without time-wasting special machine set-ups. Even in 1947, there were many who felt their tool room requirements were not varied enough for them to take full advantage of the RT's vast potential.

By adopting those early RT features on their current models, lathe makers acknowledge the greatness of LeBlond's RT Tool Room Lathe, conceived *almost 18 years ago*.

THE R. & K. LEBLOND MACHINE TOOL CO., CINCINNATI 8, OHIO

For a detailed description of  
the LeBlond 16" RT Tool Room Lathe  
and the lower-priced 16", 16-speed  
RT Engine Lathe, send for  
Bulletins RT-31 G  
and HD-31. G.

**turned faster by**



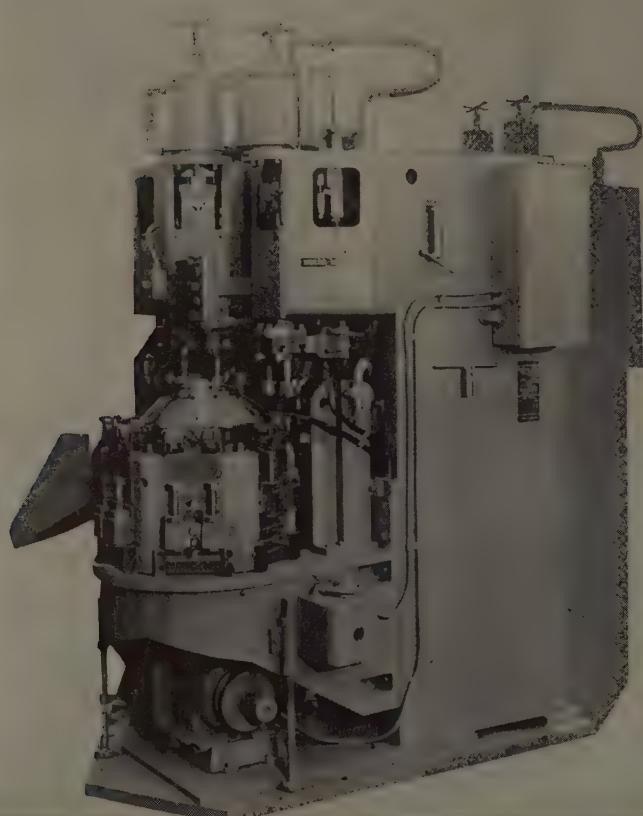
WORLD'S LARGEST BUILDER OF A COMPLETE LINE OF LATHES—FOR OVER 64 YEARS.

# "Let's call in T.W."

## "THEIR EXPERIENCE WITH AUTOMATION OF RESISTANCE WELDERS WILL COME IN HANDY ON THIS ONE"

• "What's the best method for automatically loading and unloading resistance welders?" . . . . "Can the welders be made an integral part of the production line?" . . . . "What mechanical devices can be employed to make resistance welders automatic?"

Automatic resistance welding may be the production key you have been seeking to improve your costs. By calling in T.W. you will gain the benefit of their work with automation as applied to resistance welding. One recommendation by T.W. application men may make the big difference in your costs. T.W. has the facilities, the engineers and the reputation for the best in resistance welding.



Resistance Welders Since 1898

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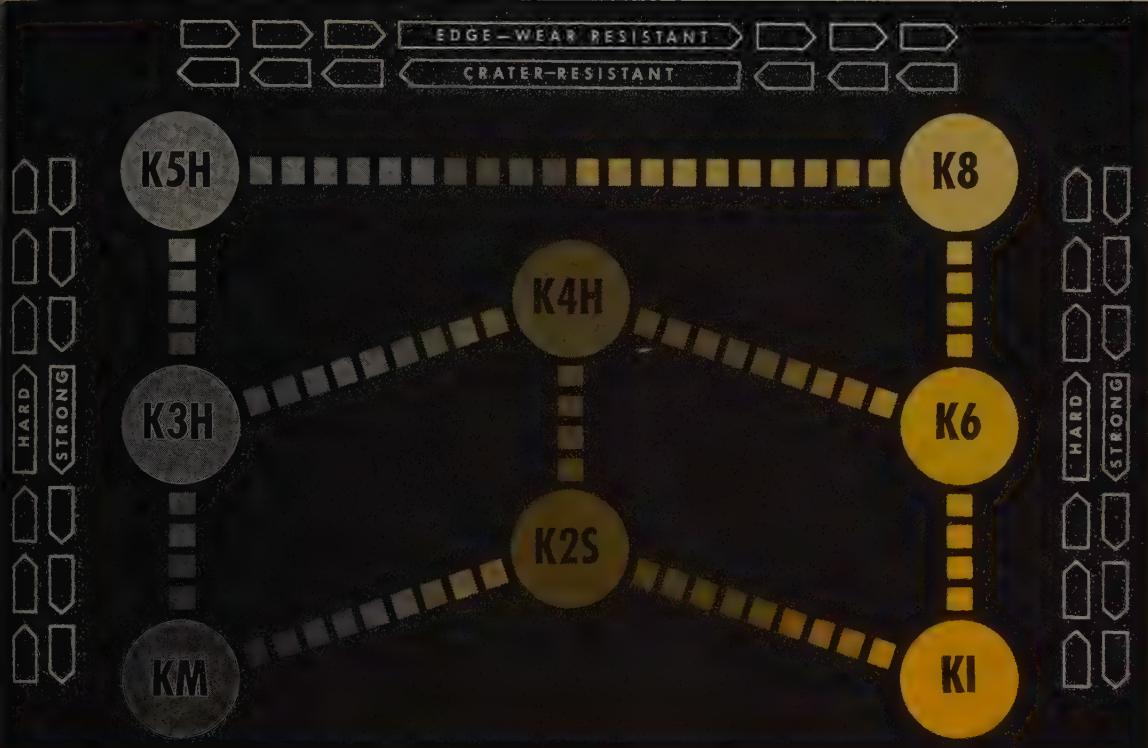
WARREN, OHIO



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Micro Switch, A division of Minneapolis-Honeywell Regulator Co., Freeport, Ill.	170
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Modern Industrial Engineering Co., Detroit	161
Modern Machine Shop Magazine, Cincinnati	163
Modernray Corp., San Leandro, Calif.	83
Mohawk Tools Inc., Montpelier, O.	200





# NOW! A Quick, Easy-to-Use Guide to Efficient Machining

## Learn WHY

"IT PAYS TO BE A GOOD TOOL DETECTIVE"

"It Pays to Be a Good Tool Detective" will be the topic for Wednesday, April 28, at 9:00 A.M., at the Carbide Seminar. Kennametal engineers will discuss selection of proper grades, feeds, speeds, depth of cut, clues to tool trouble, and solutions.

The Carbide Seminar, sponsored by ASTE, will be held at the University of Pennsylvania's Towne School, near the Convention Hall.

Here's the first simplified system for selecting carbide tool grades. Kennametal's new grade selection method assures top tool performance on every machining job. It's easy to use and eliminates guesswork because grades are grouped according to their wear characteristics (edge-wear and crater-resistant); also according to relative strength with strong, intermediate and hard grades included in each group. These eight Kennametal grades meet all machining requirements.

Kennametal's grading system is unmatched in the industry for simplicity. Any experienced machinist can use it to quickly adjust grades for better tool performance. For example: If K3H is being used and crater is no problem, a switch to K4H, which is more edge-wear resistant, will provide longer tool life. Conversely, if K4H is being used and crater is excessive, a switch to K3H would improve tool life.

Your Kennametal representative will gladly help you apply this grade selection system to your machining operations. He can also help apply these eight grades to "wear spots" in your product, your processing lines, or any place a hard, wear-resistant metal is needed. Just give him a call. Kennametal Inc., Latrobe, Pa.

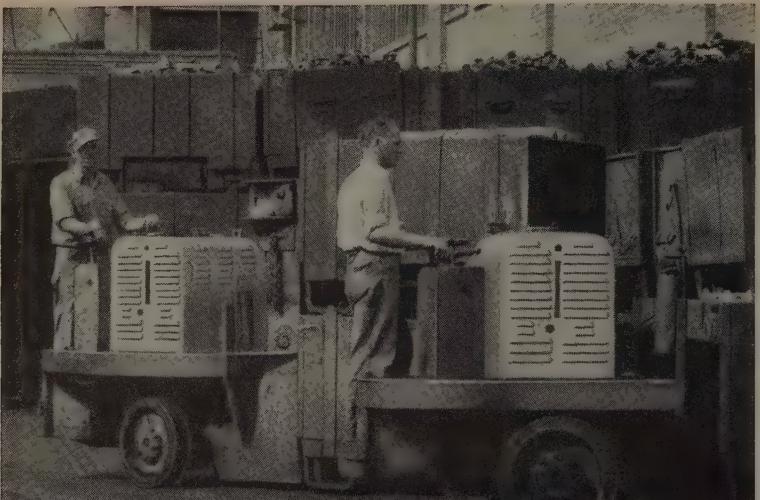
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ASTE EXPOSITION

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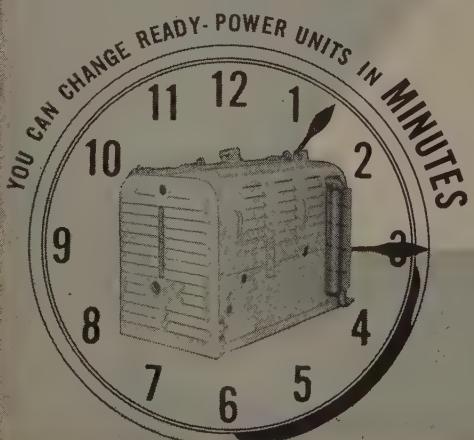
**KENNAMETAL**  
CEMENTED CARBIDE TOOLING  
THAT INCREASES PRODUCTIVITY

SALES OFFICES IN PRINCIPAL CITIES

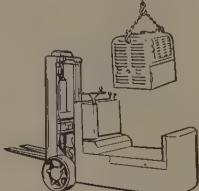


## These ELECTRIC Trucks Will Never be "Down" due to Lack of Power!

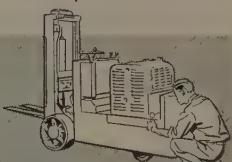
Only electric industrial trucks give you the advantage of interchangeable power so that trucks can work while power units are being serviced. With Ready-Power drive you get a double advantage: (1) The quick interchangeability of electric power units, (2) The constant full power of gas-electric or Diesel-electric drive. There are Ready-Power units for all sizes and types of electric trucks. Write for information.



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Guide spare Ready-Power  
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Fasten 4 bolts and truck is  
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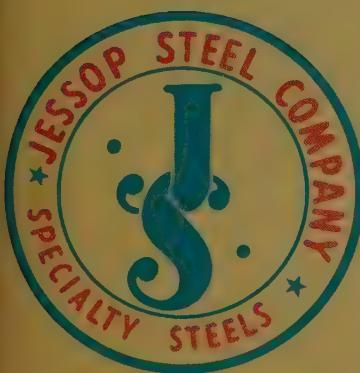
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Production Devices Inc., Whitehall, N. Y.	197
Production Machine Co., Greenfield, Mass.	173
Production Magazine, Birmingham, Mich.	81
Producto Machine Co., Bridgeport, Conn.	72
Putnam Tool Co., Detroit	171

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Of all the fine specialty steel products produced at Jessop, none is closer to the hearts of Jessop men than tool steel in the form of precision ground flat stock shown here. So much care is taken that this product will reflect Jessop's ability, that even the splendid new building in which each piece is processed, wrapped and stored is reminiscent of a research laboratory. As a customer, here's how you profit by this expression of pride. You can be completely confident of the utmost accuracy of size, finish and analysis. You can be sure of fast service, even on special sizes, because *Jessop always carries an extensive stock on hand for immediate delivery*. If

you think you might have an application for *Truform* oil or *Windsor* air hardening precision ground flat stock in the realm of dies, gages, cutters, machine parts, straight edges, or the like, write for literature. If not, show this ad to a friend who might. No one can go wrong by dealing with Jessop.

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STEEL COMPANY - WASHINGTON, PA.

# Dempster-Balester's Continuous Operation shown here by Model 350 at yard Installation



**1** With the combination Skip Pan Loader and Auxiliary-Compression Door, every phase in a Dempster-Balester's baling cycle is operated by hydraulic controls from the moment scrap is dumped into Skip Pan Loader until finished bale is ejected. Here is a series of photographs made of a Dempster-Balester Model 350 in actual operation. In photo above Skip Pan is dumping scrap metal into charging box.



**2** Skip Pan returns to be re-loaded. Photo above was made as the Auxiliary-Compression Door came in contact with scrap and crushes it into charging box. This door compresses scrap with one stroke . . . permitting the charging box door to close immediately. This, of course, means tremendous increase in the speed of the baling cycle with a resultant increase in production. The slow, costly process of manually arranging scrap with the expense of extra men is completely eliminated in most every baling cycle.

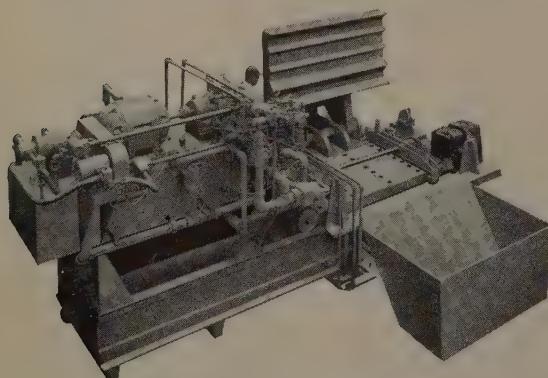


**3** After compressing the scrap with a 45-ton force, Auxiliary-Compression Door returns to up-right position and charging box door closes.



**4** Scrap is baled and then ejected. As one cycle ends another begins. Charging box door opens and Skip Pan, which has been re-loaded, dumps another load into charging box (see photo above).

Outlined photograph at left shows a Dempster-Balester Model 350 before installation. The Dempster-Balester's 1-2-3 continuous operation has advanced the scrap metal baling industry many years ahead of normal progress. Without question, Dempster-Balesters are the fastest, most efficient presses baling scrap metal today! And you have six to choose from—three standard and three high speed models that turn out high density bales in capacities to meet any requirement. Write to us for complete information. A product of Dempster Brothers, Inc.



IN CANADA: Sold by W. P. Favorite Co., Ltd., 418 Main Street East and manufactured by Hamilton Bridge Co., Ltd., both Hamilton, Ontario

**DEMPSTER BROTHERS, 844 Shea Building, Knoxville 17, Tennessee**

# WHY WE ARE USING MORE COLONIAL BROACHES

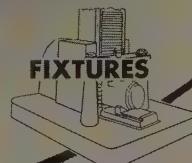
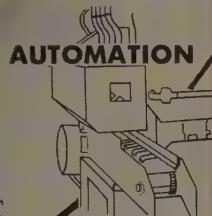
by *Plant Superintendent*  
*Oil & Pipeline Valve Manufacturer*

We feel that the long record of service we have received from Colonial Broaches should be noted. The company used its first Colonial Broach in 1927, and has been using them in generally increasing numbers ever since.

We were particularly gratified with their performance during World War II, when the quality of service, workmanship and material deteriorated in so many products. These broaches were maintained at their usual level in these respects and we were able to operate during this difficult period without broach trouble.



BROACHES



*Unified Broaching*

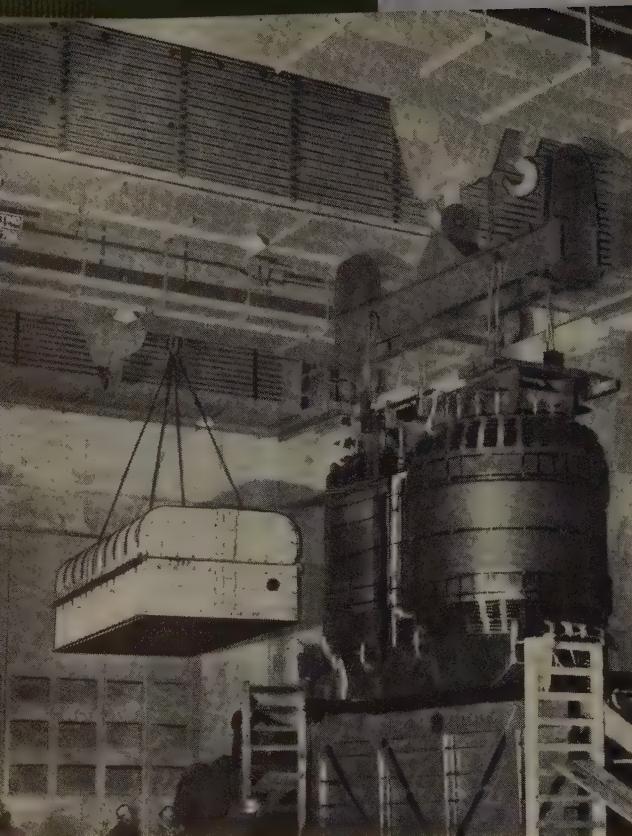
## 480 BEARING CAPS PER HOUR with Stationary Broaches

Locating faces on automotive bearing caps are broached at the rate of 480 per hour with this ingenious setup. Bearing caps are guided past stationary adjustable broach inserts. Stock removal is .0045" on each side.

This horizontal Colonial model HB1 4-ton 12-in. stroke broaching machine operates on a semi-automatic cycle, with a maximum cutting stroke of 30 feet per minute. Maximum return speed is 60 feet per minute.

*This is a Colonial Unified broaching installation*





**PINPOINT SPOTTING** is easy with a General Electric equipped crane, just as this one delicately positions the core and coils of a large power transformer. At the other extreme . . .



**HIGH-SPEED PERFORMANCE** is "job-tailored" into this whirly crane control. Each G-E control, built of standard components, is co-ordinated to the crane's characteristics

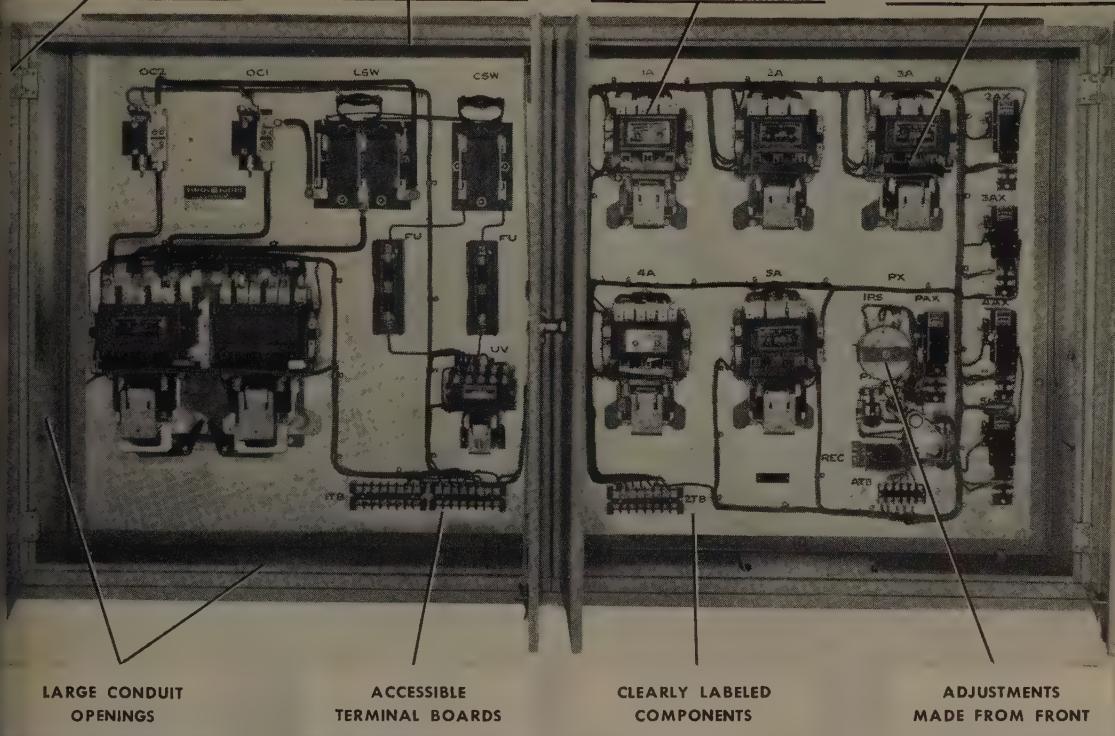
# New General Electric Control Is



**SPECIAL TESTS** were performed from this 85-foot outdoor test tower to develop G-E crane control—one of the many testing facilities at G.E.'s modern Schenectady, N. Y. plant.



**FIELD ENGINEERING** specialists in crane control are always available from G.E. to help apply the technical know-how developed in G-E laboratories to your installation needs.



LARGE CONDUIT OPENINGS

ACCESSIBLE TERMINAL BOARDS

CLEARLY LABELED COMPONENTS

ADJUSTMENTS MADE FROM FRONT

**NEW EASY-MAINTENANCE FEATURES**, as well as the proven dependability of the famous G-E "strong-box coil" motor Carter, are now built into all G-E controls—here illustrated

on a bridge and trolley control. With the addition of the new G-E NEMA II control (NEMA Service Classification for light-duty control), G.E. offers a truly complete line.

## "Job-tailored" to Your Crane

G-E a-c crane control is tailored to your new crane's station *at the factory*. G-E engineers, working closely with your crane builder, design and build a control that's perfectly co-ordinated to the crane characteristics. When it's delivered to you, it's ready to operate.

**CONTROL RESPONDS INSTANTLY** to the operator's directions, guiding the brawn of your crane with a practiced hand. That's because G.E. supplies the complete, integrated crane drive, each component designed to match the others right down the line.

**RIGGED CONSTRUCTION** provides long, dependable service—only routine maintenance required. Adjustments, when desirable, are easily made. All components are standard, and each can be quickly replaced if necessary.

**G.E. STARTED EARLY** in working with your crane

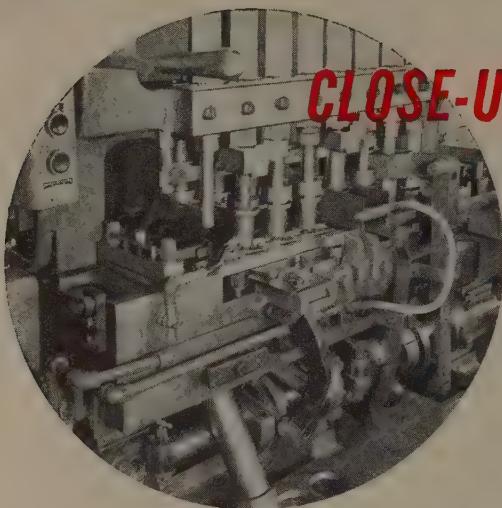
manufacturer to "job-tailor" a control for your crane. For more information, contact your nearby G-E Apparatus Sales Office, your crane builder, or write Section 780-1 for Bulletin GEA-6112 on G-E a-c crane control and accessories. *General Electric Company, Schenectady 5, N. Y.*

Section D780-1  
General Electric Company  
Schenectady 5, N. Y.

Please send me your new bulletin GEA-6112 which gives complete information on the G-E line of a-c crane control.

Name.....  
Position.....  
Company.....  
Address.....

GENERAL  ELECTRIC



Close-up of an 8-plunger WF cam eyelet machine showing tools and special attachments. Included are a lever type blank holder, a scrap box fitted with a compressed air blower and oscillating shutter, dovetailed punch holders and a hook type side stabber.

**WF Multiple Plunger Presses Are Built For Long-Lived Automatic Production Of A Wide Range Of Products**

- Known throughout the world for profit-making, high efficiency, low maintenance performance.
- Cam type is available in seven sizes . . . 6 to 12 plungers . . . cam strokes ranging from  $1\frac{1}{4}$ " to 6" . . . blank diameters up to  $4\frac{1}{2}$ ".
- For increased versatility many special attachments can be "engineered-in" to meet specific needs.
- Improved WF design includes cam rollers, friction clutch drive and lever strippers.
- For a heavier range of work, WF crank type eyelet machines are available in five standard sizes.

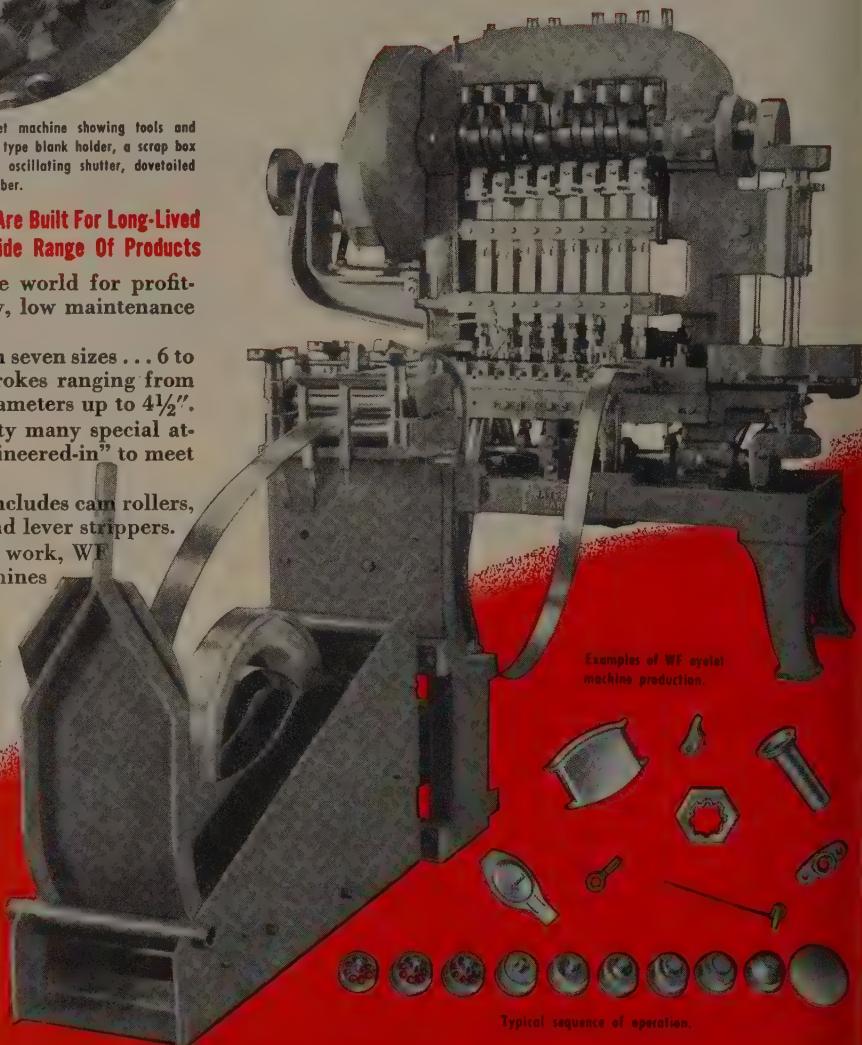
*Write today for complete free information on cam or crank eyelet machines or on any of the WF equipment listed below.*

This WF production unit includes coil box and straightener feeding into an 8-plunger cam eyelet machine.

WF-11

**CLOSE-UP of versatile mass-production ability**

# Waterbury Farrel EYELET MACHINES



Typical sequence of operation.

**WATERBURY FARREL FOUNDRY & MACHINE CO. • WATERBURY, CONN.**

Offices: Chicago, Cleveland and Millburn, N.J.

**POWER PRESSES** — Crank, Cam and Toggle; also Rack and Pinion Presses • Eyelet Machines • Multiple Plunger Presses • Horizontal and Hydraulic Presses, etc. **MILL MACHINERY** — Rolling Mills, Strip, Rod, Wire Flattening, (For Ferrous and Non Ferrous Metals) • Also Slitters • Straighteners • Cut-off Saws • Collars • Winders, etc. **WIRE MILL EQUIPMENT** — Continuous Wire Drawing Machines (Upright Cone and Tandem) • Wire Flattening Mills • Chain Draw Benches • Pointers • Swagers • Bull Blocks • String-up Machines • Spenders, etc. **COLD PROCESS BOLT & NUT MACHINERY** — Headers (all types) • Rivet Machinery • Trimmers • Thread Rolling Machines • Slotters • Nut Formers and Tappers, etc.





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Jada Tool Division, Gaines-Collins Co., Los Angeles ..... 1816

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**Paintbond**

## HOW PAINTBOND EXCELS:

**By improved paint base:** Paintbond provides greater permanence to your paint finishes than any comparable phosphate coating process . . . you can prove this with your own salt-spray tests! Even when paint is scratched through, corrosion is confined to the exposed metal; spreading corrosion, and resulting paint flaking and peeling, is prohibited!

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**By dollar savings:** It is an easily proven fact that Detrex Paintbond will coat a substantially greater surface area per drum of compound, or will provide a heavier coating with the same amount of compound. This means important dollar savings for you. Since Paintbond goes further and is easier to control in solution, you enjoy maintenance savings, too.

**By flexibility:** Whether applied by spray or immersion, Paintbond can easily be controlled to give exactly the coating weight and crystal size you desire. This important advantage spells satisfaction on every type of product and application.

**By added merchandising value:** Detrex makes available to Paintbond users an attractively designed sticker for application on their finished products. At point of sale, this sticker becomes another sales clincher for your product as it informs the customer of the life-time, rust-free paint finish that Paintbond provides.

Paintbond IS different . . . the benefits above are but a few reasons why. Like all Detrex processes, results are fully guaranteed. You can get all the facts by using the coupon below . . . do it today for better paint finishes at lower cost tomorrow.

Please send us complete facts about Paintbond and how it will improve our finishes while cutting our costs.

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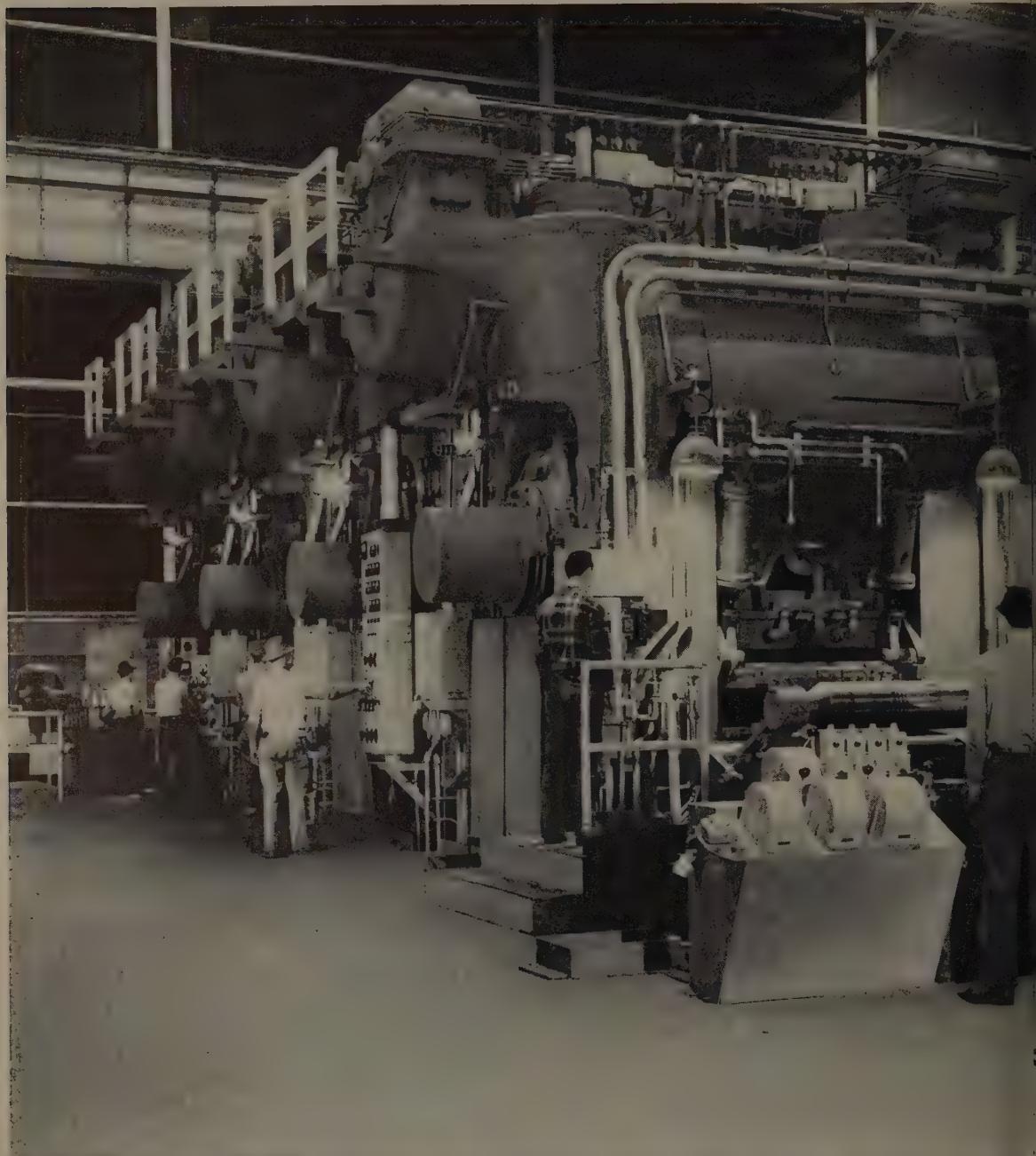
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C O R P O R A T I O N

DEPT. PB-101, BOX 501, DETROIT 32, MICH.



# Youngstown now offers cold-reduced

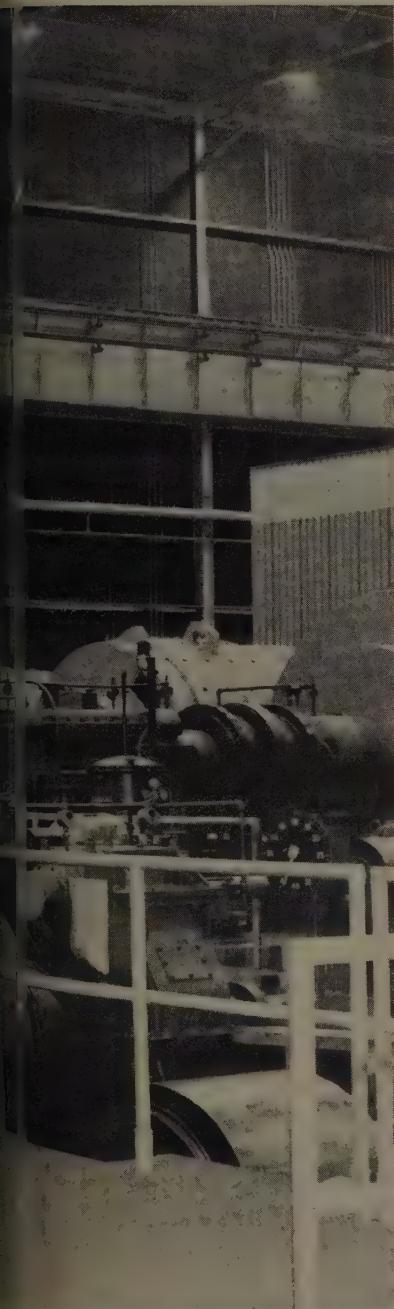


## THE YOUNGSTOWN SHEET AND TUBE COMPANY

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# Indiana Harbor Works



THIS new continuous cold-reduced sheet mill at East Chicago, with a monthly capacity of 40,000 tons, is now in production and increasing output daily. Orders for sheets and strip, up to 50" wide, are now being booked.

Completion of this mill is the latest step in a series of major additions and improvements at our Indiana Harbor Works since the war, representing an investment of many millions of dollars.

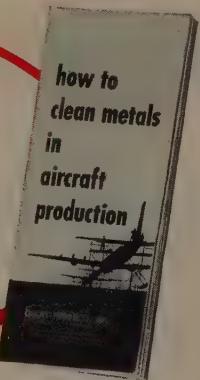
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Does any job in the following list give you trouble? If you'll circle the corresponding number in the coupon, we'll be glad to tell how we can help you.

This list of cleaning (and related) jobs was made up with the advice of several of our customers in aircraft production. It shows, in order of volume, the jobs on which Oakite has most frequently been able to save them time and money. Here it is:

- 1 Cleaning aluminum, steel and magnesium
- 2 Stripping paint (solvent or hot tank)
- 3 Machining, grinding, forming
- 4 Deoxidizing aluminum
- 5 Steam cleaning aluminum and steel
- 6 Deflocculating paint in spray booths
- 7 Preparing metal for painting
- 8 Removing scale and corrosion
- 9 Preventing corrosion

**FREE** Our 48-page illustrated booklet "How to Clean Metals in Aircraft Production" contains information on all the cleaning jobs in the list.

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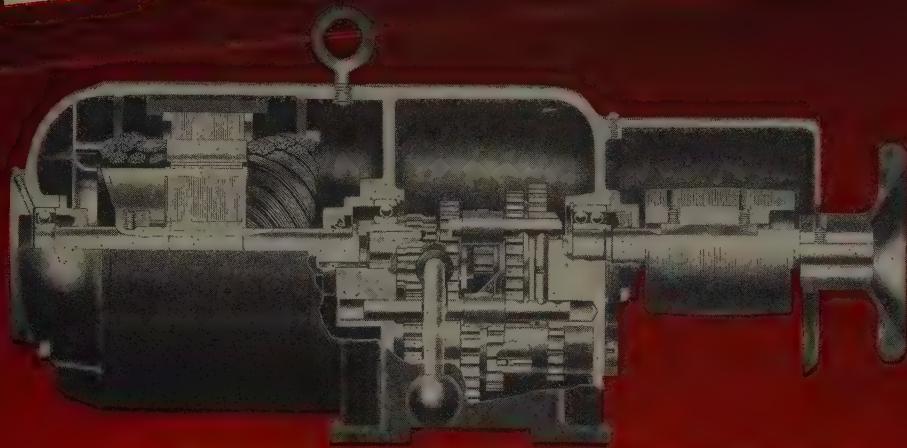
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**FIRST . . . FOR DRIVES . . . MOTORS . . . GRINDERS**



This tough, strong, cold drawn, 69-inch length of . . .

## Pittsburgh Seamless Steel Tube Is The Giant Kingpin of Budd's Revolutionary Disc Brake

Stopping 70 to 80 tons of fast moving railroad car safely, quickly and efficiently without pitching passengers out of their seats has long been a goal of railroads and car builders alike. Budd Company, after years of research, came up with the answer in the revolutionary Budd Disc Brake. It is built around a 69-inch length of the finest grade Pittsburgh Seamless Steel Tubing which acts as the giant

"kingpin" in absorbing all the stress and strain of the braking reaction.

**Here's how it works!** Old style brakes had shoes which were applied directly to the wheels' surface. The new Budd Disc Brake has a large, cast iron disc mounted on the inboard side of each wheel. Controlled friction is applied to both sides of these discs by two sets of air operated brake shoes.

**Here's the difference!** When old

style brakes were applied suddenly passengers were jolted—and dangerous heat generated in the wheels. In the Budd brake, wheels do only the jobs they were originally designed to—support and guide the car on the rails. They do not have to stop the brake drums.

Instead the brake drum function has been transferred to the air controlled disc, precisely engineered to do the job.



rm physicals make possible operations like expanding, welding, and stress testing of welds at Budd's Red Lion plant near Philadelphia.

tant job alone. Stopping is so smooth and chatter-free even under emergency application that passengers barely aware that the brakes are being applied.

**Results are as follows!** Because passenger comfort has been increased and maintenance costs reduced, old style brakes are rapidly being replaced by The Budd Company's Disc Brake on America's fast, most modern trains. Disc brakes are easier to service, cost an average \$1000 less per car, per year to maintain. They save nearly a ton of weight per car, have half as many pins and bushings to service as when using the wheel as the brake. Brake shoe life is increased 10 times!

Overall, the Budd Disc Brake is standard equipment on its new self-powered, economical Rail Diesel Car (RDC) which is reviving railroad travel in metropolitan areas by greatly reducing operating and maintenance costs.

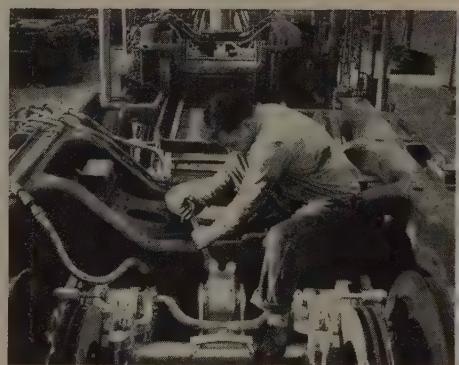
**Inherent quality helps make the impossible!** Passenger safety and comfort and increased braking efficiency, possible with the new Budd Disc Brakes, stems from brilliant design engineering and high quality of component parts. For example, Pittsburgh Cold Drawn Seamless Steel Tubing was selected for its high strength-for-weight ratio, for weldability, for close tolerance and smooth surface finish. It provides the giant "kingpin" which has an ultimate strength of 77,000 pounds per square inch—more than enough to absorb the tremendous torsion and bending stresses of the braking reaction.

All of the load of the braking reaction is carried through the "kingpin" seamless steel brake frame tube to the hanger on the railway car truck, and to the outside bearing arms. This application of Pittsburgh Cold Drawn Seamless Tubing is typical of its many vital uses in the aviation, automotive, machine tool, agricultural implement and other industries.

Pittsburgh Seamless Cold Drawn Tubing might be the "kingpin" in reducing costs and improving the products you manufacture. Why not consult a Pittsburgh Steel representative? He may have a suggestion that can save both you and your customers time and money. Write for complete information regarding Pittsburgh Seamless Cold Drawn Tubing.



A rigid, final inspection is given the completed brake assembly now aluminum painted and ready for installation on train trucks . . .



Four bolts attach the assembly to the hanger box, which is welded to truck . . .



Now installed and ready to roll on one of Budd's self-powered Rail Diesel Cars (RDC), the Budd Disc Brake greatly reduces maintenance costs while improving braking and providing greater passenger comfort.

*"Everything New But The Name"*

# Pittsburgh Steel Company

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(Advertisement)

## Finishing Forgings

Carbide insert tooling is accounting for 54 machined forgings before regrind

INTERRUPTED CUTTING of tough heat-treated SAE 4340 alloy steel forgings is being handled at an increased speed and with more than ten times longer tool life by a switch from standard brazed tools to Kennamatic sintered tungsten carbide triangular insert tooling.

Operation is being performed by Menasco Mfg. Co., Burbank, Calif., manufacturers of aircraft landing gears. Operation consists of rough and finish facing both sides of a star-shaped 11-inch diameter forging on a 10-hp Warner & Swasey No. 2A turret lathe.

This job was previously performed with various grades of standard style GR-16 tools, at 87 rpm, 0.0035-inch feed and 0.030 to 0.095-inch depth of cut. Even at this relatively low speed and feed,



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OF PITTSBURGH  
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### No Interference Here

Copper-lined room will become a part of test and research facilities of General Electric Co.'s transformer plant in Pittsfield, Mass. Copper a shield for keeping out electromagnetic waves of external origin. Concrete, masonry and Fiberglass wedge plus the 20,900 pounds of copper, are employed in the 4½-foot-thick wall

best tool life obtained was only two to four pieces per grind. Three cuts were required for each side.

**Speed and Feed Increased**  
Standard style TFR-16A, grade K5H triangular insert tools are now used for the rough cut at 101 rpm, 290 sfm and for the finishing cut at 134 rpm, 385 sfm. Feed used is now 0.0075-inch per revolution, twice that previously utilized.

Two cuts for each face of the workpiece are required. Depth of cut on roughing is 0.030 to 0.125 inch and 0.030-inch on finishing. Under these stepped-up operating conditions, nine pieces are machined before any indexing is required. Three cutting edges are available on each end of the triangular insert. Both sides of 54 pieces are faced before regrinding of the tungsten carbide tool is necessary.

**Indexing**—Changing time for previously-used tooling was 6.5 minutes. Time for indexing or rotating the triangular carbide insert tool to a new cutting edge is now only 45 seconds. To regrind the brazed tool required 15 minutes. Now, both ends of the Kennamatic inserts are reconditioned in 10 minutes production time.

# GET FAST, SAFE HANDLING

...with low cost Exide-Ironclad® power!

*This fork truck, powered by an Exide-Ironclad battery, spots this 2800 lb. loom over bolts in the base of a packing case in a few minutes. The old method took four man-hours.*



GET fast, safe and low cost handling when your lift trucks are powered by dependable Exide-Ironclad batteries. In addition, these rugged, long life batteries assure full-



shift operations and high availability of equipment. Lower costs for operation, maintenance and depreciation make Exide-Ironclads your best power buy—AT ANY PRICE!



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Alliance...

## FIRST IN SIZE! FIRST IN CRANE DESIGN!

### LOOK AT THE FEATURES OF THIS NEW CRANE!

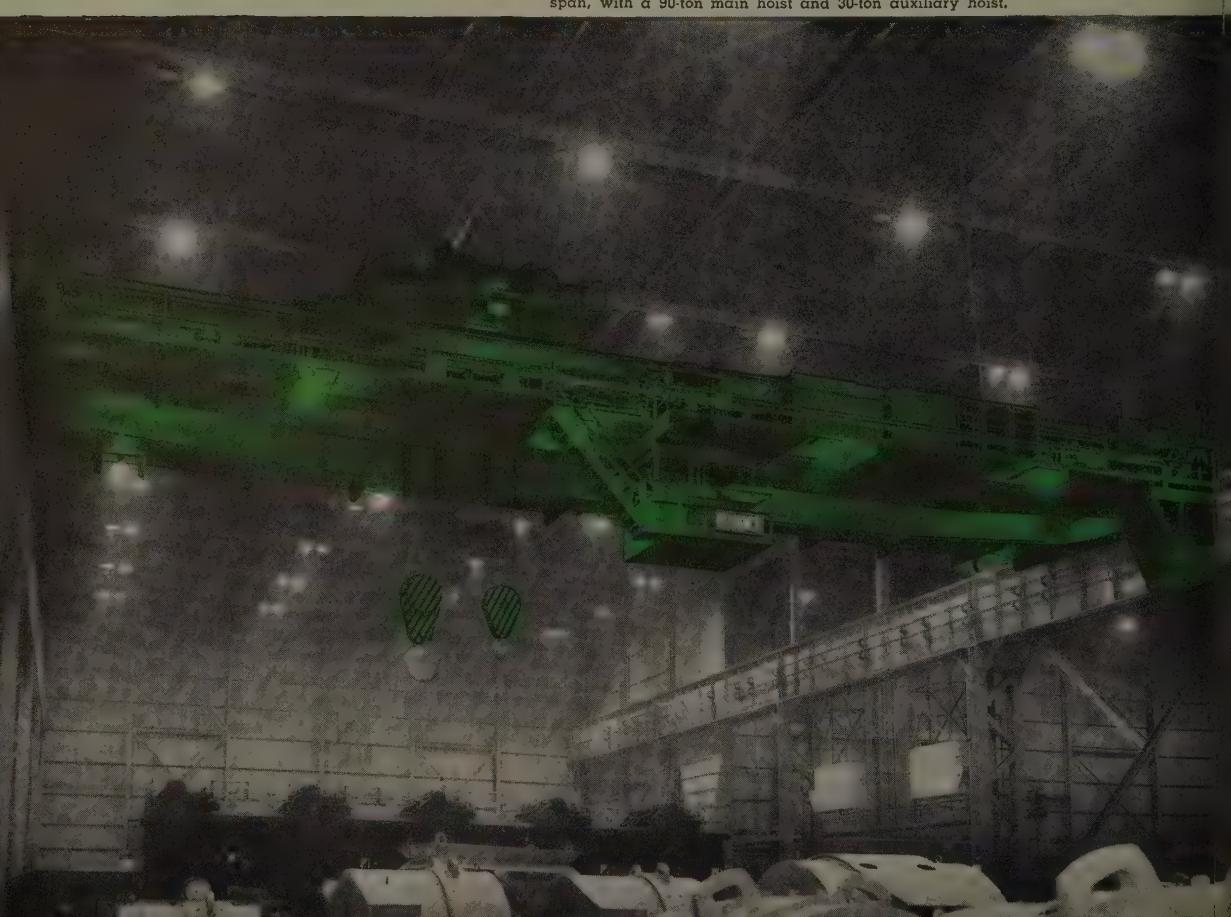
- Working parts easily accessible for quick maintenance.
- Adequate end bracing and large gusset plates keep crane square and girders plumb.
- Liberal safety factors . . . girders, ropes, bearings, gearing, motor sizes.
- Sealed lubrication on all roller bearings.
- Enclosed controls keep out mill dirt and, as located on foot walk, provide maximum accessibility.
- Operation easily and accurately controlled. Operator's cab located at center of bridge gives best visibility.
- One-piece welded trolley frame.
- All-steel construction including cast steel drums.

For over half a century leading mill designers and builders for heavy industry have turned to The Alliance Machine Company for dependable heavy-duty cranes. Alliance has constantly pioneered mechanical features which are accepted today as conventional. Alliance can develop equipment best suited to your company's particular heavy material handling needs. Write for full information.

### THE ALLIANCE MACHINE COMPANY

MAIN OFFICE • ALLIANCE, OHIO • PITTSBURGH OFFICE • OLIVER BUILDING, PITTSBURGH, PENNSYLVANIA

Alliance Standard Steel Mill Crane in the Cold Strip Reduction Department of the Fairless Works, U. S. Steel Corporation. This standard overhead crane has a 100-ft. span, with a 90-ton main hoist and 30-ton auxiliary hoist.



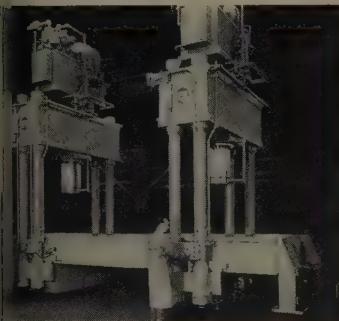
# NEW

# PRODUCTS and equipment

Reply card on page 205 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue

## Straightening Press with 400-ton capacity

A two-way straightening press with two pressure units is designed to straighten parts such as forgings, castings, extrusions and weldments where it is necessary to hold down one point while applying pressure to another point;



to apply pressure at two points simultaneously. Spot pressure can be applied over practically the entire press bed area because the two units have both longitudinal and traverse movement.

Each pressure unit has a pressure capacity of 400 tons. The bed is 264 inches long and 96 inches wide. From each ram nose (up) to the bed is 60 inches and each ram has a 24-inch stroke. Hydraulic Press Mfg. Co.

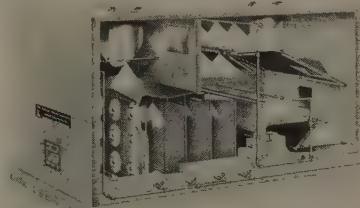
MORE DATA CIRCLE NO. 1 ON REPLY CARD

## Dust Removal System reduces dust to sludge

A new type liquid precipitating stack gas scrubber has been developed for installation in low cost usings of cinder block, concrete or fabricated steel.

The housing for the system can be built as a permanent installation or as a portable unit. All con-

nections are made conveniently to existing ducts with no need for complicated piping. Neither cloth



bags nor filters are used. All dust removed from the air is reduced to a watery sludge which can be discharged into a tank or pond for easy removal of the solids. A recirculating system can be used.

Eight models are available that can handle high temperature gases in capacities ranging from 8000 to 60,000 cfm. Johnson-March Corp.

FOR MORE DATA CIRCLE NO. 2 ON REPLY CARD

## Electric Melting Pots

...bricks reduce heat-up time

Automatic electric melting pots for soft metals are widely used in preparing metals for bearing, tinning and soldering of electrical connections.



Accurate temperature control of molten metal is provided by a thermostat bulb immersed in the

metal and protected by a cast iron tube. Heating elements for 150 to 860-pound capacity pots consist of spirally wound coils of nickel-chromium wire threaded through ceramic insulator supports to form a flexible band.

On larger pots, the helical coils are spaced and supported by refractory insulators bolted together and fastened to the heavy alloy top ring casting to form a separate unit which can be removed. Westinghouse Electric Corp.

FOR MORE DATA CIRCLE NO. 3 ON REPLY CARD

## Automatic Grinder

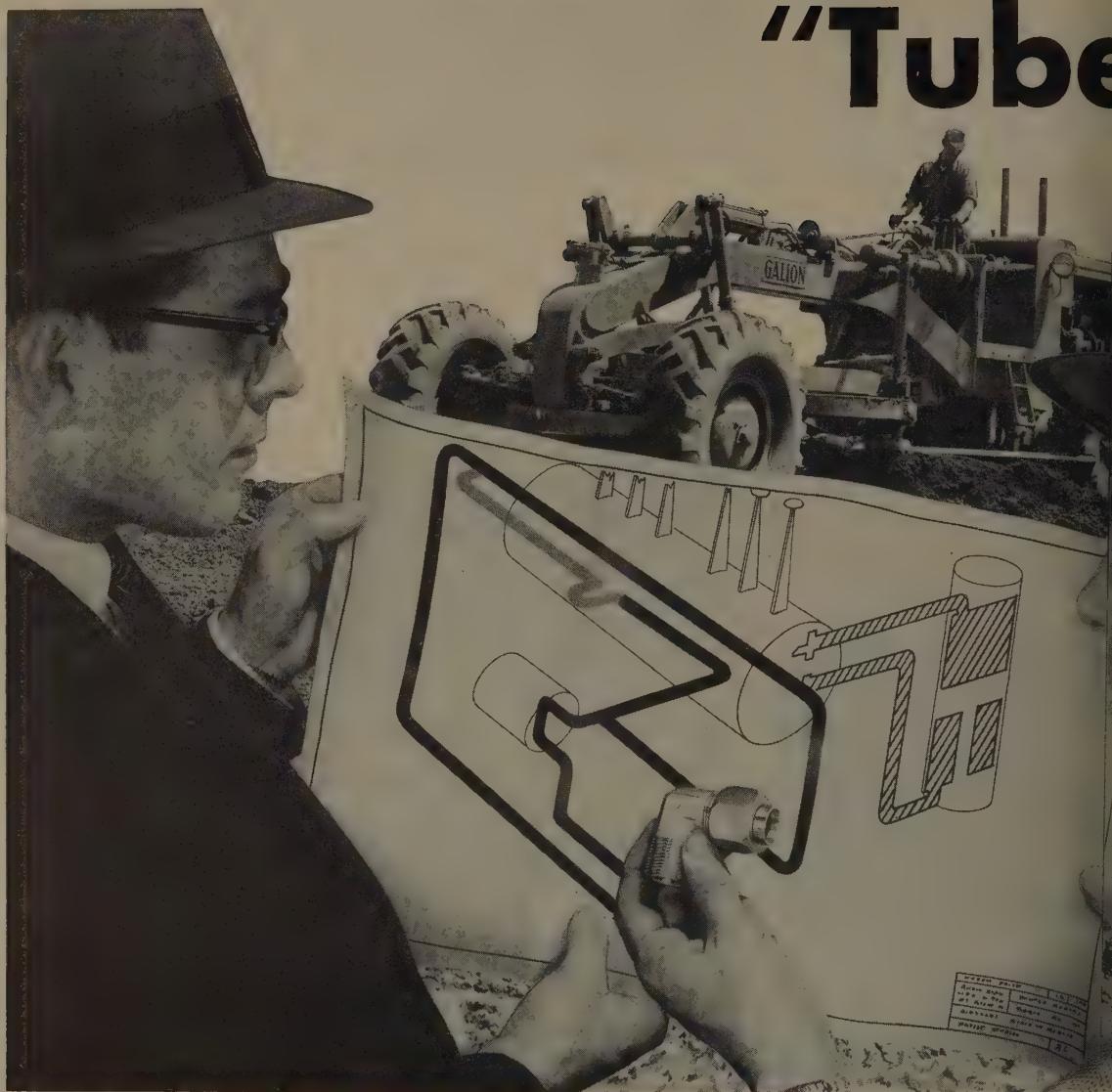
...can use standard attachments

A precision surface grinder, the model D10, offers greater capacity than previous Do-All models. Furthermore, the large capacity is



readily utilized for production flat or form grinding and the machine is designed to receive standard attachments to make such production grinding automatic. With the D10, formed parts can be mass produced with precision, comparable to tool room made parts. A

# "Tube

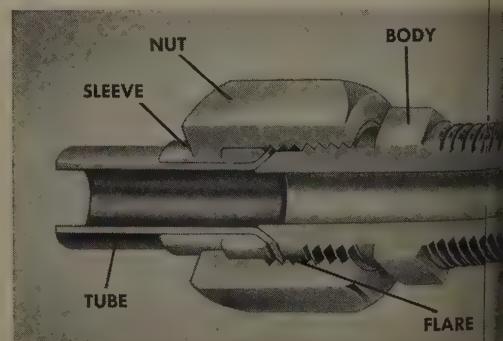


**Design engineers** at the Galion Iron Works and Manufacturing Co. of Galion, Ohio, developed a simple, foolproof hydraulic control system for their line of motor graders. It offers a high degree of

accuracy, safety, and dependability and has proved to be an outstanding success. One reason: Galion engineers specified Parker Triple-lok fittings for every grader they built.



**At tube-bursting pressures** Parker Triple-lok fittings remain intact with absolutely no leakage or distortion. They also hold leak-proof over ranges of extremely hot and cold temperatures.



**3-piece Triple-lok fittings** are stocked by distributors in steel, stainless steel, brass and aluminum alloy. They are also available in other materials on special order.

# up and forget it"

## Use leakproof Parker *Triple-lok* fittings for trouble-free equipment

This motor grader, like most mobile equipment, takes severe punishment during its daily work. Jars and jolts; stresses and strains! Hydraulic control systems must be extra safe and dependable. That's why more and more manufacturers of lift trucks, agricultural and earth-moving machinery are specifying leakproof Parker *Triple-lok* fittings.

These flare fittings are absolutely leakproof even under the severest conditions of vibration, shock, and hot and cold temperatures. Thousands of destruction tests prove they will hold pressures that burst the tubing.

Using *Triple-lok* fittings is the easiest and best way to tube up your equipment. You get low assembly torque, easy disconnection, and repeated reassembly for trouble-free joints.

These fittings meet J.I.C. and S.A.E. standards plus specifications of the A.S.M.E. Code for Pressure Piping.

As a matter of fact, *Triple-lok* is the standard of industry. More *Triple-lok* fittings are used on industrial machinery than any other fitting.

So, tube up and forget it. Specify *Triple-lok* fittings for the equipment you build. Parker offers the widest range of shapes and sizes available... for tubing outside diameters from  $\frac{1}{8}$  through 2 inches. Mail the coupon for complete fitting data.

TUBE AND HOSE FITTINGS DIVISION  
The Parker Appliance Company  
17325 Euclid Avenue, Cleveland 12, Ohio

# Parker

Hydraulic and fluid  
system components



What other Parker products for hydraulic and fluid systems interest you? Ferulok flareless fittings? New hydraulic control valves? Synthetic rubber O-rings?

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Please send Parker fittings catalog No. 4300  
 Please send descriptive literature about . . .



NAME \_\_\_\_\_ TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

Mail this coupon for catalog of complete information about Parker tube fittings... the standard of industry. If you'd like to know about other Parker products, please list them on the coupon.

flip of the switch turns the machine back to manual operation.

Other features: Crush form grinding table control; automatic skipfeed; automatic downfeed; automatic crossfeed reverse. DoAll Co.

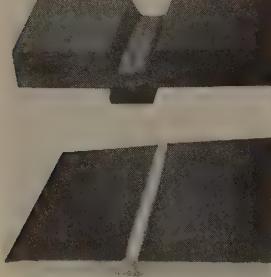
FOR MORE DATA CIRCLE NO. 4 ON REPLY CARD

### Electrode Line

*... with powdered metal coats*

The second electrode in Lincoln's line of electrodes with powdered metal coatings is announced.

Jetweld 2 is designed for high-speed welding of butt and deep groove joints to weld at the lowest



possible cost per foot, with excellent x-ray qualities, easy slag removal, good physical properties, smooth appearance and low crack sensitivity.

Lincoln reports Jetweld 2 will weld butt and deep groove joints up to 50 per cent faster than conventional electrodes. It operates on either ac or dc, with operations on ac preferred. Lincoln Electric Co.

FOR MORE DATA CIRCLE NO. 5 ON REPLY CARD

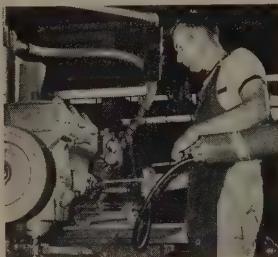
### Portable Lubricator

*... filled, weighs 15 pounds*

An air-primed portable lubricator, called Aro-Pak, enables the operator to use air power instead of muscle in lubricating complicated machinery or hard-to-reach fittings anywhere.

It consists of a cylindrical tank holding 5 pounds of grease, a carrying strap, hose and control nozzle. A hand pump primes the unit. Other features include: Visual grease level indicator; volume control nozzle; full swiveling;

pressure booster feature. A companion unit, the Aro-Fil, enables



the user to quickly and easily fill the Aro-Pak or any hand gun. Aro Equipment Corp.

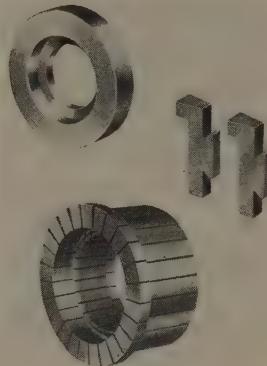
FOR MORE DATA CIRCLE NO. 6 ON REPLY CARD

### Electric Motor Parts

*... produced from sintered metal*

United States Graphite is now producing Gramix sintered metal commutator segments, slip rings, pole shoes and bearings for electric motors.

Gramix electric motor parts are



compacted under pressures up to 70,000 pounds and sintered in controlled atmosphere furnaces. They are said to cost less to produce and give better performance and longer service than machined parts. A relatively high density provides intimate contact for good conductivity. Parts can be impregnated with a variety of fluids during manufacture to give longer wear with little maintenance. United States Graphite Co.

FOR MORE DATA CIRCLE NO. 7 ON REPLY CARD

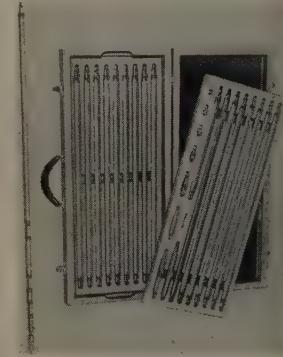
### Inside Micrometer

*... readings to 30 feet*

An inside micrometer capable of high accuracies in lengths up to 30

feet is offered by Brown & Sharpe.

The instrument has a minimum reading of 6 feet and a maximum of 30 feet; it will measure any dimension between. A special micrometer head and 25 extensions, used in combination, permit this broad coverage. Each extension is calibrated to the nearest ten-thousandth, permitting excellent overall accuracy. For portability, the



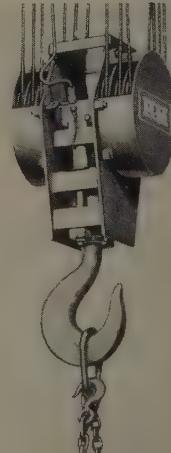
entire set is packaged in a carrying case. Brown & Sharpe Mfg Co.

FOR MORE DATA CIRCLE NO. 8 ON REPLY CARD

### Crane Scale

*... weighs during handling*

Hook-a-Weigh is the name given to an electronic weighing device developed by P & H Overhead Crane Division. Designed for



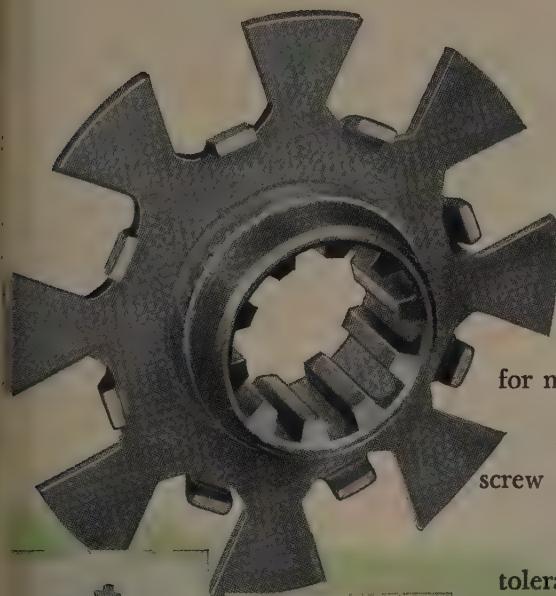
overhead cranes, it provides accurate weighing service for any type of load while it is being handled.

The need for a separate weighing operation in many cases is eliminated, with products movin

How the design, development and production team at Burgess-Norton made possible

# Cost Savings of 17% On this Clutch Hub

Here is another example of how redesign for modern production methods produced a better part at lower costs. This clutch hub was formerly made from a machined forging. By combining a screw machined part and a stamping through hydrogen-copper brazing, as shown below, production costs were reduced 17% . . . greater control on flange tolerances obtained, and eight stop lugs could be used instead of only four.



The original forged hub design required greater machining time, and often produced excessive scrap because of flange thickness variations.

Basic components of the new design are a stamped and formed flange and a screw machined center hub.

The two parts are then assembled with copper rings and brazed under controlled atmosphere conditions to eliminate oxidation.

After the hydrogen-copper brazing operation, the hub splines are cut on horizontal broaching machines.

Final operations are in the stamping department, where spring slots are pierced and stop lugs formed.

## COMPLETE FACILITIES

## FROM DESIGN THROUGH PRODUCTION FOR BETTER PARTS AT LOWER COSTS



Engineering is one of the important cogs in the complete service offered to industry by B-N. This experienced group works closely with production and metallurgy in designing for low cost manufacture and better end-use performance.

### HARDENED AND GROUNDED SCREW MACHINE PRODUCTS



Pins, Bushings, Shafts

Burgess-Norton facilities and equipment are extremely diversified for the economical production of a wide range of precision parts, and include complete engineering, development, and metallurgy departments. This engineering service is available to you without obligation. If you have a parts production problem, we believe it will pay you to check into Burgess-Norton facilities. Send prints, specifications, or samples . . . or, if you prefer, one of our sales engineers will call, at your convenience.

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GENEVA, ILLINOIS

Serving Industry For Over 50 Years

STAMPED AND MACHINED ASSEMBLIES,  
BRAZED, WELDED, HEAT TREATED



Tanks, Hydraulic and Other Components

## NEW PRODUCTS and equipment

directly from one phase of production to the next without stopping. The scale may be used on any crane and is available in capacities up to 200,000 pounds. Harnischfeger Corp.

FOR MORE DATA CIRCLE NO. 9 ON REPLY CARD

### Cutting Pliers

... fit in workman's pocket

Cam action, high leverage cutting pliers, which, though only 9

inches long, cut up to  $1/8$ -inch hardened steel drill rod, is announced



by Utica. Pow'r Pli'rs are said to handle jobs for which a 24-inch bolt-cutter or a hack saw would

be used. Jaws of the pliers are forged, extra hardened and hand honed. Handles are pressed steel. Utica Drop Forge & Tool Corp.

FOR MORE DATA CIRCLE NO. 10 ON REPLY CARD

### Bench Wax Tank

... for small size dipping

Designed for small size dipping operations and low in cost, the ST-3 bench tank should effect real economy in handling. It can be plugged into any standard electrical outlet.

Portable and fast heating, the unit works under thermostatic control. Low current consumption



BME-24 two-station universal Burr-Master deburs and chamfers both spur and helical gears as well as straight and involute form external splines.

Hit a new high  
in GEAR  
DEBURRING  
EFFICIENCY on  
a TWO-STATION  
UNIVERSAL  
*Burr-Master*

Maximum operator utilization is yours with the BME-24 two-station universal Burr-Master for high production gear deburring and chamfering of spur and helical gears as well as straight and involute form splines.

Both stations can be tooled identically to handle the same gear, they can perform two different operations on the same part, or operate completely independently, turning out large volumes of two entirely different gears. Only one operator is required with any of these setups. At each station you can chamfer the entire tooth form and root at the rate of 5 teeth per second. High volume isn't all you get with the Burr-Master. Quick and simple changeover and long-life form tools lick the problem of down time and the need for skilled operators.

Complete details in Bulletin 103-60. Ask for it.



See the Burr-Masters in action  
in Booth 1617 at the  
ASTE INDUSTRIAL EXPOSITION  
in Philadelphia, April 26-30



makes it ideal for small parts wax dipping and permits it to double as a glue pot when necessary. Aeroil Products Co. Inc.

FOR MORE DATA CIRCLE NO. 11 ON REPLY CARD

### Electrochemical Process

... for finishing Lurium

A German-developed electrochemical process, which produces a permanently-brilliant surface finish on metal parts made of Lurium, is now being licensed by Fromson. Lurium is a high-purity aluminum introduced into the United States by this company.

The Lubrite process uses common and relatively inexpensive chemicals. While current density during the brightening process is high, time required is only 30 to 60 seconds. Cost of ingredients is low. Fromson Orban Co. Inc.

FOR MORE DATA CIRCLE NO. 12 ON REPLY CARD

### Labeling Tape

... adheres to oily surfaces

A pressure-sensitive labeling tape will adhere to oily as well as to dry metal surfaces. Oil-Stik combines with oil to produce

in bond, yet permits the tape to be stripped off any time without leaving a mark.

Developed for identifying, warning and for every other labeling



the tape has writing surface suitable for pencil, ink or crayon. can be preprinted. Tape is available in widths from  $\frac{1}{2}$  to 22 inches 60-yard rolls on standard 3-inch cores. Labelon Tape Co. Inc.

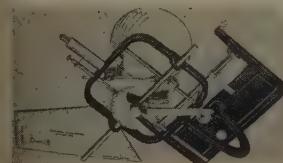
FOR MORE DATA CIRCLE NO. 13 ON REPLY CARD

#### Drawing Machine

for accurate drawings

A drawing machine introduced by Bruning enables technical illustrators and draftsmen to make accurate pictorial drawings in less time.

Two simple settings, one to establish the major diameter, one the minor diameter, enable the user to draw mathematically precise ellipses in any ratio by degrees or



from points on a drawing. Repeated and related ellipses on the same axis are achieved through the instrument's rolling parallel action. Charles Bruning Co. Inc.

FOR MORE DATA CIRCLE NO. 14 ON REPLY CARD

#### Nylon Inserts For Nuts

extend usability

As an insert material, nylon has been preferred for many applications because it is unaffected by such liquids as gasoline, kerosene, alcohol, motor oil, grease, soaps and caustics. It retains good torque characteristics in sub-zero temperatures.

Extended locknut re-usability which nylon makes possible is par-

ticularly important in case of anchor and gang channel nuts. Ny-



lon inserts are now standard on these lines. Elastic Stop Nut Corp.

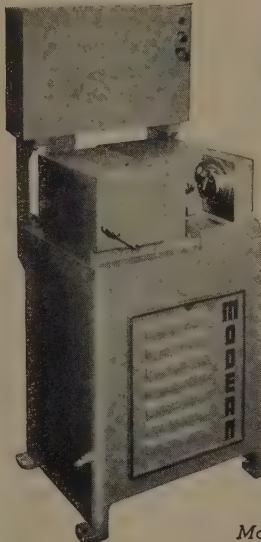
FOR MORE DATA CIRCLE NO. 15 ON REPLY CARD

#### Cleaning Solution

destroys useless chromium

A product called Chromekill 4A is designed for destruction of hexavalent chromium in alkaline cleaning and plating solutions. It was designed to give a dual action: Fast reduction of hexavalent chromium to the harmless trivalent chromium state; more stable reducing agents to give prolonged protection.

The material is available as a fine free-flowing powdered mixture



## High Production Universal Burr-Master for deburring and chamfering Internal Gears

Model BMI-14 Burr-Master deburrs and chamfers internal splines and helical or spur gears from  $\frac{1}{8}$ " to  $3\frac{1}{2}$ " pitch diameter.

Only

Only

Only

Only

Burr-Master's patented action chamfers both sides of the tooth and root of internal splines, straight sided or involute form helical or spur internal gears.

Burr-Master gives you a high production rate of 5 teeth per second, long-life circular form tools, rapid change-over and the versatility needed to handle all internal gears within its work range.

Burr-Master combines all these features with operating simplicity that permits even an inexperienced operator to maintain a high production rate.

Modern builds the Burr-Master.

Complete details in Bulletin 103-81. Ask for it.



See the Burr-Masters in action  
in Booth 1617 at the  
**ASTE INDUSTRIAL EXPOSITION**  
in Philadelphia, April 26-30

and is used in concentrations of the order of  $\frac{1}{4}$  ounce per gallon. A test solution for determining the presence of hexavalent chromium in alkali cleaners as well as plating solutions is also available. Enthone Inc.

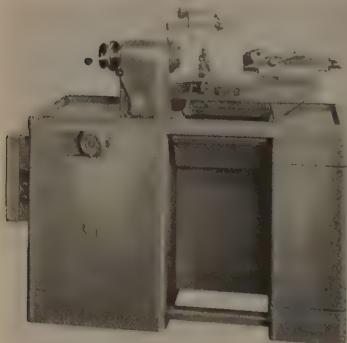
FOR MORE DATA CIRCLE NO. 16 ON REPLY CARD

### Hand Screw Machine

... gives instant reversals

Model No. 73 hand screw machine includes a feature said to give instant reversals without disturbing continuous forward operations of the motor.

A hardened and ground self-centering bed has two symmetrically beveled sides, assuring balanced



precision alignment of all attachments. The drive, enclosed in the pedestal cabinet, gives an infinitely variable speed with a top spindle speed of 3500 rpm. Powered by a 1-hp motor, high-low speeds in a ratio of 5 to 1 are obtained through a clutch. The brake is provided for quickly stopping headstock spindle. Wade Tool Co.

FOR MORE DATA CIRCLE NO. 17 ON REPLY CARD

### Metallizing Process

... increases pot life

A line of metallized pressed steel pots for heat treating makes possible 200 to 300 per cent longer life on some metal melting and heat treating operations.

Special impregnated metal coatings on the outside surface of the container protect it against heat oxidation and scaling at various temperature ranges up to 1850°F. Choice of three different coatings in all standard sizes and shapes permits pot life for a variety of jobs. Eclipse Fuel Engineering Co.

FOR MORE DATA CIRCLE NO. 18 ON REPLY CARD

# FREE LITERATURE

## Catalogs and Clip Sheets

Reply card on page 205 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue

### Hydratork Drive

Clark Equipment Co.—Design, operation and maintenance of the recently introduced, clutchless Hydratork Drive are covered in an 8-page, illustrated brochure. A description of operational details, illustrations including close-up photographs of cutaway working production units and photographs showing assembly and disassembly of the drive are included.

FOR MORE DATA CIRCLE NO. 19 ON REPLY CARD

### Bonding Cement

Ceilcote Co.—"Corcbon, An Improved Bonding Cement for Brick and Tile" is the title of a 4-page illustrated catalog. Among its technical and general information on the product is a section describing the manner in which the bonding cement sets. A chemical resistance chart serves as a guide to chemical applications.

FOR MORE DATA CIRCLE NO. 20 ON REPLY CARD

### Standards

American Standards Association—Thousands of questions about the mechanical field in this country and foreign countries are answered by the ASA's library. A booklet offered by ASA, "The Library of Standards," tells what the library service is, what it contains and what it can do for you. It's a pocket-sized guide to 60,000 standards, specifications and related documents, and file of technical material.

FOR MORE DATA CIRCLE NO. 21 ON REPLY CARD

### Grinder-Polisher

Hammond Machinery Builders Inc.—The company offers a 4-page brochure covering their polishing lathe and abrasive belt backstand. Bulletin 635 is illustrated, with

text covering advantages of machines and giving speeds and standard specifications of a few of them.

FOR MORE DATA CIRCLE NO. 22 ON REPLY CARD

### Radiation Digest

General Electric Co.—First issue of a new industrial publication known as "Radiation Digest," has been published by G. E. The digest presents original material in easy-to-read, digest form, plus abstracts of major current literature of interest to men in fields in which x-ray, electron beam and related radiation devices are employed.

FOR MORE DATA CIRCLE NO. 23 ON REPLY CARD

### Metal Compacting Press

Baldwin-Lima-Hamilton Corp.—Bulletin 3104 describes the model L 50-ton powdered metal compacting press, and lists its design specifications. A table of exclusive features explains how the press is designed for high-quality low-cost production in the fabrication of parts from metal powders.

FOR MORE DATA CIRCLE NO. 24 ON REPLY CARD

### Lubrication Film

Stewart-Warner Corp.—Alemite Division offers the sound slide film "No Margin for Error." The film contains answers to lubrication problems that are headaches to cost conscious production men. The audience is taken into a typical industrial plant showing the right and wrong way to handle lubricants from barrel to bearing. A 12-page booklet offered with the movie is titled "Five Plans for Better Plant Lubrication."

FOR MORE DATA CIRCLE NO. 25 ON REPLY CARD

### Arc Welding Accessories

Metal & Thermit Corp.—An illustrated, 20-page catalog of ar-

# SOLARIS

## SURE-SPEC STEELS

*steel for any part  
you make for any product  
anytime at minimum cost!*



*This Cross Country 1954 car offers something new for greater luggage storage—the auxiliary Travel Rack. Solar furnishes some of the steel for this snappy Nash Rambler*

*"for service dependable as the sun"*

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You're sure to get  
true strip gauge tolerances  
when you buy  
**Follansbee Cold Rolled Strip!**



When you specify Follansbee Cold Rolled Strip, you get more than just the width you require. You're sure of true strip gauge tolerances as well as the right temper and working qualities necessary in your press operations. These proper qualities keep production costs down all along the fabricating line. The fact that you can feed your presses directly from coils of Follansbee Cold Rolled Strip assures additional efficiency and economy.

Regardless of the type of stamping or forming operation, the uniformity of Follansbee Cold Rolled Strip is sure to offer many real advantages. Consult your Follansbee Steel representative about the quick, direct, personalized service you can get directly from the mill. His suggestions on strip steel specifications may be of real help.



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POLISHED BLUE SHEETS AND COILS SEAMLESS TERNE ROLL ROOFING  
COLD ROLLED STRIP

Sales Offices—New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee, Chicago, Indianapolis, Kansas City, Nashville, Los Angeles, San Francisco, Seattle, Toronto, and Montreal, Canada. Plants—Follansbee, West Virginia; Follansbee Metal Warehouses: Pittsburgh, Pa., Rochester, N. Y., Fairfield, Conn.

welding accessories is intended to provide a quick reference source. Included are electrode holders, helmets, eye shields, ground clamps, cleaning tools, gloves, welding cable and many other related products.

FOR MORE DATA CIRCLE NO. 26 ON REPLY CARD

**V-Belt Drive Films**

Allis-Chalmers Mfg. Co.—Second group in a series of 35-mm sound slide films is available through the General Machinery Division. Titles are: "In Every V-Belt Drive," "For Better Driving" and "Selecting a Drive." The first covers engineering principles basic in every v-belt drive application; the second, installation and maintenance of multiple v-belt drives; the third, how to check characteristics to find the best type of drive.

FOR MORE DATA CIRCLE NO. 27 ON REPLY CARD

**Tube Bending Press**

Pines Engineering Co. Inc.—An illustrated bulletin describing the mechanical features and operating advantages of a 20-ton hydraulic bending press is offered. Four pages describe the many new design features of the press, which has been especially built to handle pipe and tube sizes up to 2 inches OD by 0.083 wall.

FOR MORE DATA CIRCLE NO. 28 ON REPLY CARD

**Motor Frame Chart**

Reliance Electric & Engineering Co.—To dispel confusion over new motor mounting dimensions, Reliance has produced the "Company A-Frame" chart to aid in quickly comparing old and new NEMA frame assignment standards. The single page chart shows at a glance comparative dimensions of open type and fan-cooled type polyphase induction motors. Sub-charts compare frame sizes according to horsepower and speed.

FOR MORE DATA CIRCLE NO. 29 ON REPLY CARD

**Electrical Modernization**

Westinghouse Electric Corp.—A 16-page booklet on electric modernization in industrial plants is available from Westinghouse. "Compete or Collapse" is the title of the booklet, which points out that while modernization is the key to successful competition, the first step in any modernization

# USE A CARD

**FREE CATALOGS and LITERATURE**

**NEW PRODUCT INFORMATION**

**INFORMATION ON ADVERTISED PRODUCTS**

**FREE EDITORIAL CLIP SHEETS**

ogram must be the efficient distribution of electrical power. Principal elements of a modern electrical system are described and illustrated.

MORE DATA CIRCLE NO. 30 ON REPLY CARD

## Production Turning

Monarch Machine Tool Co.—A major tool development designed specifically to simplify, speed and economize on a broad range of broom and production-turning operations is the subject of a booklet issued by Monarch. Photographs supplement 20-page text, attachments and specs are listed.

MORE DATA CIRCLE NO. 31 ON REPLY CARD

## Jig Bushings

Ex-Cell-O Corp.—A new drill bushing catalog reports bushings which were previously listed specials are now standard and carried in stock. Drill size ranges have been increased and new lengths have been added to the four groups of renewable bushings and liners. A conversion chart has been added.

MORE DATA CIRCLE NO. 32 ON REPLY CARD

## Chuck Catalog

Taft-Peirce Mfg. Co.—"The Superpower Magnetic Chuck Catalog" No. 411, covers their entire line of electromagnetic chucks. Chuck sizes, specifications and prices are included, as well as general information concerning applications and advantages of magnetic chucking.

MORE DATA CIRCLE NO. 33 ON REPLY CARD

## Company Facilities

R. C. Mahon Co. — "A Picture Story of R. C. Mahon Co." is a 46-page report designed to portray their extensive metal fabricating and production facilities, its prod-

ucts and services and its capacity to serve industry. The activities, products and production methods of the eight divisions are treated separately.

FOR MORE DATA CIRCLE NO. 34 ON REPLY CARD

## Low-Alloy Steel

Jones & Laughlin Steel Corp.—A 25-page catalog offers information on Jalten low-alloy, high-strength steel. The book is designed to show what Jalten is, what it does, where it is being used now, and how it can be used advantageously in your own applications.

FOR MORE DATA CIRCLE NO. 35 ON REPLY CARD

## Nickel Plating

International Nickel Co. Inc. — Bulletin No. 77 is a 44-page general publication with over 40 illustrations, tables and charts designed to provide the designer, specifying engineer and user with basic information on electroplating and nickel plating. Mechanical properties are given and recommendations on preparation of basis metals made.

FOR MORE DATA CIRCLE NO. 36 ON REPLY CARD

## Shaving Machines

National Broach & Machine Co. — A 16-page, two color illustrated catalog describes Red Ring horizontal shaving machines for large external gears. The catalog is illustrated and contains a complete specification and capacity table for four models.

FOR MORE DATA CIRCLE NO. 37 ON REPLY CARD

## Silent Chain

Link-Belt Co.—An 88-page Silent Chain book, No. 2425, contains comprehensive engineering data. Book lists pre-engineered stock drives for normal requirements in a 16-page section. Another section

For free literature, editorial clips or more information on products described in this issue, circle the corresponding number at left—or fill in box below

PAGE

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4-19-54



April 19, 1954

## Market

## Outlook

A NEW LOW for the year was set by steel ingot production in the week ended yesterday. The rate was 67 per cent of capacity. This marked the second consecutive week of a decline of a point from the preceding week.

April thus far is the weakest steel production month this year. All of the weeks of the first two months of the year were characterized by steel ingot production rates in the 70s, and the first week of March was a strong 70 per cent. All of April's production has been below 70 per cent.

**SITTING IT OUT**—Ordinarily, in a civilian economy the steel business picks up in the spring. This year it has been dropping off. The seasonal factor has been thwarted by heavy inventories carrying over from the war economy that existed into last year. When the inventories are used up, the seasonal buying patterns can emerge again. "Meanwhile, we'll have to sit this one out," one steel salesman says.

**CONTRASTS**—Evidence that steel consumers are still living off inventories can be found in the automobile industry, largest steel user in the country. The U. S. automobile industry is using steel at a rate of only 15 per cent below that of a year ago, but the steel industry's ingot production is down 31 per cent.

Because steel consumption did decline about the time the inventory reduction was started, the time needed to complete the inventory reduction has been prolonged.

**STRAWS IN THE WIND**—Some people think that steel production will rise during the summer when completion of inventory reductions

sends buyers back into the market for steel. Heraldng such a trend may be the buying plans reported in a STEEL survey. Those reporting in the survey say they expect to buy 3.7 per cent more steel tonnage in May than they bought in March. Of those reporting on May plans compared with March performance, 46 per cent expect to make no change, 20 per cent expect to buy less, and 34 per cent expect to buy more steel.

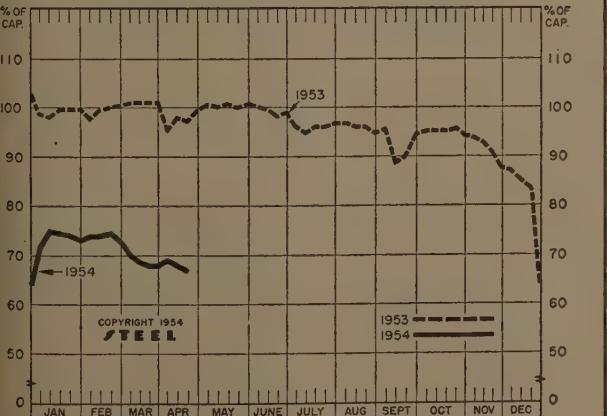
**STRONG POINTS**—Products in strongest demand today are tubular goods. In some areas, sales of light and medium tubular products have improved steadily during the last month, and sales now are not far below volume during the comparable period of last year. One producer reports April order books for seamless tubing are filled, and an early filling for May is in prospect. In that same area, butt-weld pipe is available in two to four weeks. Pittsburgh Steel Co. says its backlog of tubular goods is large and may keep its tube mills running at capacity the rest of this year.

Demand for galvanized sheets is strong, too. Producing this strength are a good rate of building construction and the government grain bin program.

Other forms of finished steel showing seasonal upturns are merchant wire, structural shapes and tin plate.

**PRICES STEADY**—Price indexes remain unchanged, although there are scattered and minor downward revisions in response to competition. STEEL's price composite on finished steel continues at \$113.70 a net ton.

## NATIONAL STEELWORKS OPERATIONS



## DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Apr. 18	Change	Same Week 1953	1952
Pittsburgh	69	-2	98.5	102
Chicago	74.5	0*	105	94
Mid-Atlantic	59	-3	98.5	93
Youngstown	63	-1	95	95
Wheeling	73	-1.5	100.5	101.5
Cleveland	68.5	+1.5	105.5	97
Buffalo	67.5	0	106.5	104
Birmingham	48	-31	101	102
New England	60	+9	87	85
Cincinnati	56.5	-12.5	94	94
St. Louis	62.5	0	75.5	90
Detroit	59	-7	106	107
Western	80	+3	110.5	89.5
National Rate	67	-1	97	96.5

## INGOT PRODUCTION\*

	Week Ended Apr. 18	Week Ago	Month Ago	Year Ago
INDEX	99.9†	101	100.4	138.7
(1947-1948=100)				
NET TONS	1,604†	1,622	1,613	2,228

\*Change from preceding week's revised rate.  
†Estimated. †Amer. Iron & Steel Institute.  
Weekly capacity (net tons): 2,384,549 in 1954; 2,254,459 in 1953; 2,077,040 in 1952.

## PRICE INDEXES AND COMPOSITES

## AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Apr. 13

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1 ....	\$4.400	Bars, H.R. alloy .....	\$8.575	Strip, C.R., stainless, 430		Tin plate, hot-dipped, 1.25	\$8.43
Rails, light, 40 lb .....	5.767	Bars, H.R. stainless, 303		(lb) .....	\$0.415	lb .....	
Tie Plates .....	5.125	(lb) .....	0.418	Strip, H.R., carbon .....	4.975	Tin plate, electrolytic, 0.25	7.13
Axes, railway .....	7.250	Bars, H.R., carbon .....	4.873	Pipe, black, butt-weld (100	lb .....	lb .....	
Wheels, freight car, 33 in. (per wheel) .....	47.000	Bars, reinforcing .....	4.900	ft) .....	14.454	Black plate, can making	
Plates, carbon .....	4.550	Bars, C.F., carbon .....	7.980	Pipe, galv., butt-weld (100	17.731	quality .....	6.23
Structural Shapes .....	4.367	Bars, C.F., alloy .....	11.000	ft) .....	141.960	Wire, drawn, carbon .....	7.71
Bars, tool steel, carbon (lb) .....	0.415	Bars, C.F., stainless, 302		Piping, line (100 ft) .....	149.518	Wire, drawn, stainless, 430	
Bars, tool steel, alloy, oil hardening (lb) .....	0.505	(lb) .....	0.433	ft) .....		(lb) .....	0.54
Bars, tool steel, H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb) .....	1.075	Sheets, H.R., carbon .....	4.765	Casing, oil well, carbon (100		Bale ties (bundle) .....	5.65
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb) .....	1.550	Sheets, C.R., carbon .....	5.704	ft) .....	214.113	Nails, wire, 8d common .....	7.48
		Sheets, galvanized .....	6.945	Tubes, boiler (100 ft) .....		Wire, barbed (80-rod spool) .....	6.84
		Sheets, C.R., stainless, 302		Tubing, mechanical, carbon		Woven wire fence (20-rod roll) .....	
		(lb) .....	0.548	(100 ft) .....			
		Sheets, electrical .....	9.000	Tubing, mechanical, stain- less, 304 (100 ft) .....	161.193		
						† Not available.	

## FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Apr. 13	Apr. 6	Month Ago	Mar. Average
(1947-1949=100) .....	140.9	140.9	140.9	140.9

## STEEL's FINISHED STEEL PRICE INDEX\*

	Apr. 15	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100) .....	189.74	189.74	189.74	181.31	154.01

Index in cents per lb ..... 5.140 | 5.140 | 5.140 | 4.912 | 4.172 |

## STEEL's ARITHMETICAL PRICE COMPOSITES

	Apr. 15	Week Ago	Month Ago	Year Ago	5 Yr. Ago
Finished Steel, NT* .....	\$113.70	\$113.70	\$113.70	\$110.98	\$94.40
No. 2 Fdry. Pig Iron, GT .....	56.54	56.54	56.54	55.04	46.61
Basic Pig Iron, GT .....	56.04	56.04	56.04	54.66	46.1
Malleable Pig Iron, GT .....	57.27	57.27	57.27	55.77	47.1
Steelmaking Scrap, GT .....	25.33	25.33	24.33	43.75	24.0

\*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 5 of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130. †Revised

## COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Apr. 15 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago	PIG IRON, Gross Ton	Apr. 15 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh .....	4.15	4.15	4.15	3.95	3.35	Bessemer, Pitts. ....	\$57.00	\$57.00	\$57.00	\$55.50	\$47.00
Bars, H.R., Chicago .....	4.15	4.15	4.15	3.95	3.35	Basic, Valley .....	56.00	56.00	56.00	54.50	46.0
Bars, H.R., del. Philadelphia .....	4.405	4.405	5.302	4.502	3.818	Basic, del. Phila. ....	59.66	59.66	59.66	59.25	49.3
Bars, C.F., Pittsburgh .....	5.20	5.20	5.20	4.925	3.95	No. 2 Fdry, Pitts. ....	56.50	56.50	56.50	55.00	46.5
Shapes, Std., Pittsburgh .....	4.10	4.10	4.10	3.85	3.25	No. 2 Fdry, Chicago .....	56.50	56.50	56.50	55.00	46.2
Shapes, Std., Chicago .....	4.10	4.10	4.10	3.85	3.25	No. 2 Fdry, Valley .....	56.50	56.50	56.50	55.00	46.5
Shapes, del. Philadelphia .....	4.38	4.38	4.38	4.13	3.492	No. 2 Fdry, del. Phila. ....	60.16	60.16	60.16	59.75	49.8
Plates, Pittsburgh .....	4.10	4.10	4.10	3.90	3.50	No. 2 Fdry, Birm. ....	52.88	52.88	52.88	51.38	43.3
Plates, Chicago .....	4.10	4.10	4.10	3.90	3.40	No. 2 Fdry (Birm.) del. Cinc. ....	60.43	60.43	60.43	58.93	49.4
Plates, Coatesville, Pa. ....	4.10	4.10	4.10	4.33	3.75	Malleable, Valley .....	56.50	56.50	56.50	55.00	46.5
Plates, Sparrows Point, Md. ....	4.10	4.10	4.10	3.90	3.45	Malleable, Chicago .....	56.50	56.50	56.50	55.00	46.5
Plates, Clayton, Del. ....	4.10	4.10	4.10	4.35	3.85	Ferromanganese, Duquesne. ....	200.00	200.00	200.00	223.00*	163.0
Sheets, H.R., Pittsburgh .....	3.925	3.925	3.925	3.775	3.25	*75-82% Mn, gross ton, Etna, Pa. ....	74-76% Mn, net ton.				
Sheets, H.R., Chicago .....	3.925	3.925	3.925	3.775	3.25						
Sheets, C.R., Pittsburgh .....	4.775	4.775	4.775	4.575	4.00	SCRAP, Gross Ton (including broker's commission)					
Sheets, C.R., Chicago .....	4.775	4.775	4.775	4.575	4.00	No. 1 Heavy Melt, Pitts. ....	\$26.50	\$26.50	\$25.50	\$44.00	\$25.0
Sheets, C.R., Detroit .....	4.975	4.975	4.975	4.775	4.20	No. 1 Heavy Melt, E. Pa. ....	22.00	22.00	22.00	43.50	23.2
Sheets, Galv., Pittsburgh .....	5.275	5.275	5.275	5.075	4.40	No. 1 Heavy Melt, Chicago .....	27.50	27.50	25.50	42.75	24.0
Strip, H.R., Pitts. ....	4.425	4.425	4.425	3.975-4.225	3.50	No. 1 Heavy Melt, Valley .....	25.50	25.50	23.50	42.75	23.0
Strip, H.R., Chicago .....	3.925	3.925	3.925	3.725	3.30	No. 1 Heavy Melt, Cleve. ....	22.50	21.50	20.50	42.75	21.0
Strip, C.R., Pittsburgh .....	5.45	5.45	5.45	5.10-5.80	4.375	No. 1 Heavy Melt, Buffalo .....	23.50	23.50	24.00	45.50	24.0
Strip, C.R., Chicago .....	5.70	5.70	5.70	5.35	4.25	Rails, Rerolling, Chicago .....	34.50	34.50	36.50	52.00	32.0
Strip, C.R., Detroit .....	5.65	5.65	5.65	5.30-6.05	4.20	No. 1 Cast, Chicago .....	38.50	36.00	33.00	42.00	29.0
Wire, Basic, Pitts. ....	5.525	5.525	5.525	5.225-5.475	4.15						
Nails, Wire, Pittsburgh .....	6.55	6.55	6.55	6.35	5.20						
Tin plate (1.50 lb), box, Pitts. ....	\$8.95	\$8.95	\$8.95	\$8.95	\$7.75						

## SEMI-FINISHED STEEL

	Bill. forging, Pitts. (NT) .....	\$75.50	\$75.50	\$75.50	\$70.50	\$61.00
Wire rods, 7/8-1" Pitts. ....	4.525	4.525	4.525	4.425	3.775	

## NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

## PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots 21.50, pigs 20.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.	Beryllium Aluminum: 5% Be, \$72.75 per lb of contained Be, f.o.b. Reading, Pa.
Aluminum Alloy: No. 13, 12% Si, 23.30; No. 43, 5% Si, 23.10; No. 14, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.	Beryllium Copper: 3.75-4.25% Be, \$40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.
Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Texas, in bulk, Foreign brands, 98.5%, 25.50-26.00 New York, duty paid, 10,000 lb or more.	Cadmium: Sticks and bars, \$1.70 per lb del.
Beryllium: 97%, lump or beads, \$71.50 per lb f.o.b. Cleveland or Reading, Pa.	Cobalt: 97-99%, \$2.60 per lb for 550 lb keg, \$2.62 per lb for 100 lb case; \$2.67 per lb under 100 lb.
	Columbium: Powder, \$75.00 per lb, nom.
	Copper: Electrolytic 30.00 del. Conn. Valley,

## DAILY NONFERROUS PRICE RECORD

Price	Last Change	Previous Price	Mar. Avg.	Feb. Avg.	Apr. 1953 Avg.
Copper ....	Apr. 15	Apr. 12	29.75-30.00	29.865	30.755
Lead ....	13.80	Apr. 12	13.55	12.735	12.473
Zinc ....	10.25	Mar. 29	9.75	9.657	9.389
Tin ....	97.25	Apr. 15	97.50	92.518	102.587
Nickel ....	60.00	Jan. 14, 1953	56.50	60.000	60.000
Aluminum ....	21.50	July 15, 1953	20.50	21.500	20.500
Magnesium ....	27.00	Mar. 9, 1953	24.50	27.000	27.000

Quotations in cents per pound based on: Copper, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99 + %, del.; Magnesium 99.8%, Freeport, Tex.

30.125 del. Midwest; Lake 30.00 del.; E. refined 29.75 del.	Germanium: 99.9%, \$295 per lb nom.
Gold: U. S. Treasury, \$35 per oz.	Iridium: \$145-\$150 per troy oz.
Iridium: 99.9%, \$2.25 per troy oz.	Lead: Common 13.80, chemical 13.90, reading 13.90, St. Louis; New York basis, 0.20.
Lithium: 98%, \$11-\$14 per lb, depending quantity.	Magnesium: 99.8%, self-palletizing pig 270; notched ingot 27.75, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., Madison, Ill., add 1.20 for Port Newark, N. J.
Magnesium Alloys: AZ91C and alloys C, H, and R 32.50; alloy M 34.50, 10,000 lb or more, f.o.b. Freeport, Tex., or Madison, Ill. 1.20 for Port Newark, N. J.	Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks, 1.3 in. diameter, 46.00, 1000 lb.
Molybdenum: Powder 99% hydrogen reduced \$3.40 per lb; pressed ingot \$4.06 per lb; sintered ingot \$5.63 per lb.	Magnesium: 99.8%, self-palletizing pig 270; notched ingot 27.75, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., Madison, Ill., add 1.20 for Port Newark, N. J.
Nickel: Electrolytic cathodes, sheets (4 x 48, and larger), unpacked 60.00; 25-lb pigs 625; "XX" nickel shot 63.65; "F" nickel shot	Mercury: Open market, spot, New York \$220-\$222 per 76-lb flask.

for addition to cast iron, 60.00; prices  
Port Colborne, Ont., including import  
New York basis, add 0.92.

U m: \$140-\$150 per troy oz. nom.

Platinum: \$21 per troy oz.

Promium: \$84-\$87 per troy oz from refineries.

Promium: \$16-\$21.50 per mg radium content, adding on quantity.

Promium: \$125 per troy oz.

Promium: \$70-\$75 per troy oz.

Promium: 99.5%, \$5-\$8 per lb.

Promium: 16.50, carlots; 17.00 l.c.l.

Promium: Sheet, rod \$39.00 per lb; powder \$5 per lb.

Promium: \$1.75 per lb.

Promium: \$12.50 per lb.

Straits, New York, spot, 97.25; prompt,

5.

Promium: Sponge, 99.3% +, grade A-1 ductile

(% Fe max.) \$4.72; grade A-2 (0.5% Fe

.) \$4.46 per pound.

System: Powder, 98.8%, carbon reduced, 1 lb lots \$4.65 per lb f.o.b. shipping point; than 1000 lb \$4.80; 99% hydrogen reduced, \$4.95. Treated Ingots \$6.70.

Prime Western 10.25, brass special 10.50, immediate 10.75, E. St. Louis, freight al-

over 0.50 per pound. High grade 11.60, (al. high grade 11.75, die casting alloy

t 14.25, del.

Platinum: Sponge \$10 per lb; powder elec-

tric grade \$15, flash grade \$11.50.

Chromium, manganese and silicon met-

als listed in ferroalloy section.)

## SECONDARY METALS AND ALLOYS

minimum Ingot: Piston Alloys 21.00-22.50;

12 foundry alloy (No. 2 grade) 20.00-

0, 5% silicon alloy, 0.60 Cu max., 22.50-

0; 13 alloy, 0.60 Cu max., 22.50-23.50;

alloy 21.75-22.75; 108 alloy 20.50-21.50

deoxidizing grades, notch bars, granular

or shot: Grade 1, 21.00-22.00; grade 2,

21.20-21.50; grade 3, 18.50-19.50; grade 4,

41.00.

Ingots: Red brass, No. 115, 28.00; tin

ize No. 225, 38.50, No. 245, 32.25; high-

tin bronze, No. 305, 31.00; No. 1

20, No. 405, 22.25; manganese bronze No.

26.75.

minimum Alloy Ingots: AZ63A, \$1.50; AZ91B,

10; AZ91C, \$1.50; AZ92A, \$1.50.

## NONFERROUS MILL PRODUCTS

### COPPER WIRE

1. soft, f.o.b. eastern mills, 100,000 lb lots,

\$6; 30,000 lb lots, 35.48; l.c.l. 35.98. Weath-

er, 100,000 lb, 36.28; 30,000 lb, 36.53;

37.03. Magnet wire del., 15,000 lb or

or 41.83; l.c.l., 42.58.

### LEAD

les to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh). Sheets, full rolls, 140 sq ft or

\$19.00 per cwt; pipe, full coils \$19.00

cwt; traps and bends, list prices plus 30%.

### TITANIUM

less per lb, 100,000 lb and over, f.o.b. mill.)

ets, \$15; sheared mill plate, \$12; strip, \$15;

\$10; forging billets, \$6; hot-rolled and

red bars, \$6.

### ZINC

ets 23.00, f.o.b. mill, 38,000 lb and over.

bon zinc in coils, 18.50-20.50, f.o.b. mill,

900 lb and over. Plates 19.00-22.5.

### ZIRCONIUM

te \$27; H.R. strip \$28; C.R. strip \$35;

ged or H.R. bars \$27; wire, 0.015 in., 1

t per linear foot.

### NICKEL, MONEL, INCONEL

"A" Nickel Monel Inconel

et, C.R. 88.5 67.5 92.5

et, C.R. 92.5 70.5 98.5

et, H.R. 84.5 66.5 90.5

Shapes 82.5 65.5 88.5

less Turbines 115.5 100.5 137.5

et, Blocks 60.0 ....

## ALUMINUM

(30,000 lb base; freight allowed over 499 lb)

Sheets and Circles: 28 and 38 mill finish c.l.

Thickness Widths or

Range Diameters, Flat Coiled Sheet Coiled

Inches In., Inc. Sheet\* Sheet Circle

0.249-0.136 12-49 32.9 ... ...

0.135-0.096 12-48 34.4 ... ...

0.095-0.077 12-48 35.1 32.7 37.5

0.076-0.061 12-48 35.7 32.9 37.7

0.060-0.048 12-48 36.1 33.2 38.1

0.047-0.038 12-48 36.6 33.6 38.4

0.037-0.030 12-48 37.0 34.0 39.1

0.029-0.024 12-48 37.6 34.3 39.8

0.023-0.019 12-36 38.3 35.1 40.4

0.018-0.017 12-36 39.1 35.7 41.3

0.016-0.015 12-36 40.0 36.5 42.5

0.014 12-24 41.0 37.5 43.8

0.013-0.012 12-24 42.1 38.2 44.8

0.011 12-24 43.1 39.4 46.4

0.010-0.0095 12-24 44.3 40.5 48.0

0.009-0.0085 12-24 45.6 41.9 50.0

0.008-0.0075 12-24 47.1 43.1 51.8

0.007 12-18 48.6 44.6 54.1

0.006 12-18 50.2 46.0 59.1

\* 72-180 in. lengths, † 26 in. max. dia.

## ALUMINUM

Plates and Circles: Thickness 0.250-3.0 in.,

24-60 in. width or dia., 72-240 in. lengths.

Alloy Plate Base Circle Base

3S-F, 3S-F ..... 62.4 36.3

50S-F ..... 33.5 37.4

4S-F ..... 34.5 39.1

52S-F ..... 36.2 40.9

61S-T6 ..... 37.4 41.5

24S-T4\* ..... 39.3 45.4

75S-T6\* ..... 47.1 53.7

\* 24-48 in. widths or dia., 72-180 in. lengths.

## ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or Round— Hexagonal—

across flats 11S-T3 17S-T4 11S-T3 17S-T4

Drawn

0.125 59.8 57.9 ... ...

0.156-0.172 50.6 48.9 ... ...

0.188 50.6 48.9 ... 62.4

0.219-0.234 47.9 46.2 ... ...

0.250-0.281 47.9 46.2 ... 59.5

0.313 47.9 46.2 ... 56.8

Cold-finished

0.375-0.531 46.6 44.9 56.2 53.4

0.563-0.688 46.6 44.9 53.4 50.2

0.750-1.000 45.5 43.8 48.9 47.8

1.063 45.5 43.8 ... 45.7

1.125-1.500 43.8 42.1 47.8 45.7

Rolled

1.563 42.7 41.0 ... ...

1.625-2.000 42.1 40.4 ... 44.1

2.125-2.500 41.1 39.4 ... ...

2.750-3.375 39.9 38.2 ... ...

## ALUMINUM

Forging Stock: Round, Class 1, 43.8-34.4,

in specific lengths 36-144 in. diameters 0.375-

8 in.; rectangles and squares, Class 1, 50.2-

38.4 in. random lengths 0.375-4.0 in. thick,

widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 63S-T6, 20 ft

length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe Nom. pipe

size, in. size, in.

% \$15.05 2 \$ 127.70

1 23.65 4 228.50

1 1/4 32.00 6

1 1/2 38.25 8 343.80

## MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in.

94.00, 0.064-in. 73.00, 0.125-in. 60.00, 30,000

lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 53.00, 20,000 lb or

more 0.250-in. and over, widths to 48 in.,

lengths to 144 in.; raised pattern floor plate,

59.00, 20,000 lb or more, 1/4-in. thick, widths

24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, 1/4 x 2 in.

69.20, 1 x 4 in. 63.00. Rod 1 in. 68.00, 2 in.

62.50. Tubing, 1 1/4 OD x 0.045-in. 87.00.

Angles, 1 x 1 x 1/4-in. 72.90, 2 x 2 x 1/4-in.

67.00. Channels, 5 in. 67.80. I-Beams, 3 in.

66.20.

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67.00. Channels, 5 in. 67.80. I-Beams, 3 in.

66.20.

## SCRAP ALLOWANCES \*

Sheet, Strip, Plate, Rod, Wire

Seamless, Heavy Ends Turnings

26.000 25.250

26.000 25.250

19.750 18.000

19.500 18.000

18.000 17.000

17.500 16.500

17.250 16.250

17.000 16.000

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# Nonferrous Metals

Metals buying by fabricators runs ahead of use. Resumption of inventory building stems from rising market. Buyers are proceeding cautiously

SMALL-SCALE replica of last year's boom-bust cycle in metals could be shaping up.

Fabricator's buying is running ahead of use. The sharply rising market contributes to this resumption of inventory buying, but to date purchasing agents have kept their perspective and proceeded cautiously.

**What's Needed?**—If fabricators do stampede the market and "mortgage their future," as one observer puts it, they could find themselves long on metal again. Then the market, propelled upwards by their overbuying, would start its downhill roll.

Prices abroad have fluctuated more violently than those at home. In sensitive international trading centers, a wave of "war scare" jitters last week touched off frenzied, near-panicky buying. It sent tin, copper, lead and zinc quotations soaring on the London Metal Exchange. The inevitable reaction wasn't far behind, but levels of all are generally higher than when they started.

**At Home**—In the U. S., lead, custom smelter copper, tin, mercury, brass and bronze ingot and copper-base scrap saw higher prices last week. Demand for all is relatively strong and incoming orders steady. April promises to be the best month for sales so far this year in nearly all nonferrous metals. Business prospects for fabricators are brightening in many areas, too.

Signs are more evident that the inventory unloading of the last nine months that depressed prices and sales volume is nearing an end. Fabricators, who once carried 90-120 day stocks, are said to be back to 30 days or less. Many are inclined to let producers carry their inventory, buying only for short periods ahead. While this policy keeps them in a more liquid position, it also contributes to price fluctuations in spot metal and prevents downward pressure on futures.

**Good Month**—After seven weeks of climbing, prices appear to be leveling off for the bulk of the metals group. Since early March, lead has moved up 1.5 cents, zinc 1 cent. Mercury showed the sharpest advance—\$25 per 76-pound flask—for which government buying abroad is largely responsible.

Tin quotations are again changing almost hourly; last week they hit the

price range (\$1.00-\$1.10) where stocks from an international buffer pool would have to be sold. Custom smelters have advanced their copper price to a flat 30 cents, equal to the charge of mine producers, and report they're already sold out through May. There's no consensus among market men about how strong their bubble is. But they know if there's trouble, the government stockpile is available for temporary repairs.

## STILL CLIMBING

### Lead Stocks\*

(Net tons at smelters and refiners)

MAR. 1, 1954....206,004

FEB. 1, 1954....199,774

JAN. 1, 1954....196,340

MAR. 1, 1953....159,057

### Zinc Stocks†

(Net tons at smelters)

APR. 1, 1954....201,171

MAR. 1, 1954....199,994

FEB. 1, 1954....198,712

APR. 1, 1953....99,864

Sources: \*American Bureau of Metal Statistics  
†American Zinc Institute

## Prices Turn Upward

Most dramatic of the price increases last week was in tin. It jumped 4 cents on the strength of Far Eastern developments and broke the \$1 mark for the first time in a year, but quickly subsided. Sale of 750 tons of tin to Argentina helped tighten the spot market.

Brass and bronze ingots tilted upwards from 0.5 to 2.25 cents on the strength of tin and copper scrap. Red brasses advanced 1 cent, tin bronzes 0.5 to 2.5 cents, yellow brasses 1 cent, and manganese bronzes 0.5 cent.

Lead marked its sixth successive quarter-cent increase since Mar. 9 and returned to its plateau of late summer at 14 cents. Scrap lead moved

up fractionally but smelting charges on battery plates remained at \$50-55.

## On the Trail of Uranium

Now that the atomic bomb is past, you'd think interest in uranium would be tapering. Not so, says the U. S. Geological Survey. Search for uranium is now one of the most intensive ever made for any metals in U. S. history, V. E. McKelvey told petroleum geologists in St. Louis. About 500 geologists are now employed by government and industry in this work, concentrated in western states. There are more geologists in uranium study than in all other minerals combined except oil, he reported.

## Below Par

Fourteen critical materials still fall far short of stockpile goals, ODM Director Arthur S. Flemming told a Senate subcommittee last week. Of the 75 materials in the government stockpile program, 38 are in good shape, 12 near the goal and 11 in fair shape, he reported. Through fiscal 1953, obligations for stockpiling topped \$4.7 billion, with expenditures in excess of \$3.5 billion.

## Market Memos

• World stocks of refined copper at the end of March topped 400,000 tons for the first time since before World War II, and domestic stock of 125,759 were highest since 1949. Deliveries to consumers edged up to 95,759 tons but production followed suit as 117,546 tons of refined were turned out.

• Heavy demand for copper and copper alloy scrap from Japan and Europe plus higher bids from ingot makers and custom smelters here keep prices bumping at the ceiling of virgin copper.

• Brass and wire mills expect April to be their top month to date this year, though under year-ago levels.

• Aluminum springs are now being used on windows made of light metals. They have retained their resilience in three years of use.

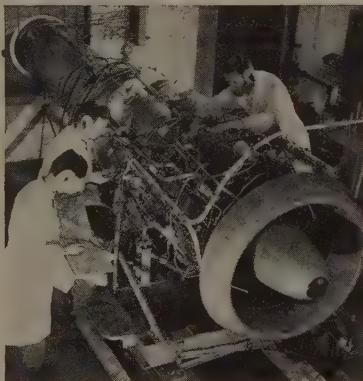
• Forty per cent longer nonwelded brass coils with weight per inch t width increased from 70 to 10 pounds are being rolled from new continuous-cast flat bars at Scovil Mfg. Co. Weight and size of standard bar was raised from 2200 to 310 pounds. These coils already represent one-third of the company's total shipment of coiled brass.

# MAKE IT ALLOY

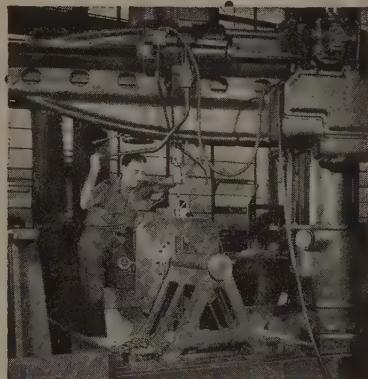
*Versatile, dependable Chromium Steels  
are doing more different jobs today  
than ever before.*



**Structural Alloy Steels**—For greater strength and hardness in crankshafts, springs, transmission gears, countershaft pins, sway eliminator bars, through-hardened arings and other critical parts, much of the alloy steel used by makers of automotive and farm equipment now contains chromium.



**Stainless Steels**—Every well-known type of stainless—both straight chromium grades and chromium-nickel grades—owes its resistance to heat and corrosion primarily to chromium.



**Tool Steels**—Whether for cutting, hot and cold forming, or die casting, whether the end product is a hand chisel or a forging die, nearly every present-day type of tool steel gets much of its strength and hardness from chromium.

The finest alloy steels  
made with Vancoram  
ferro alloys.

## VANADIUM CORPORATION OF AMERICA

420 Lexington Avenue, New York 17, N. Y.

Detroit • Chicago • Pittsburgh • Cleveland



*Make it better...make it alloy*

Producers of alloys, metals and chemicals

## STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on page 213. Key to footnotes, page 215.

## SEMI-FINISHED

INGOTS, Carbon, Forging (INT)	
Fontana, Calif. K1	\$.86.00
Munhall, Pa. U5	.59.00
INGOTS, Alloy (INT)	
Detroit R7	\$.63.00
Fontana, Calif. K1	.88.00
Midland, Pa. C18	.62.00
Munhall, Pa. U5	.62.00

## BILLETS, BLOOMS &amp; SLABS

Carbon, Rolling (INT)	
Alliquippa, Pa. J5	\$.62.00
Bessemer, Pa. U5	.62.00
Claireton, Pa. U5	.62.00
Enzley, Ala. T2	.62.00
Fairfield, Ala. T2	.62.00
Fontana, Calif. K1	.70.00
Gary, Ind. U5	.62.00
Johnstown, Pa. B2	.62.00
Lackawanna, N.Y. B2	.62.00
Munhall, Pa. U5	.62.00
So. Chicago, Ill. U5	.62.00
So. Duquesne, Pa. U5	.62.00

## Carbon, Forging (INT)

Alliquippa, Pa. J5	\$.75.50
Bessemer, Pa. U5	.75.50
Buffalo R2	.75.50
Claireton, Pa. U5	.75.50
Cleveland, Pa. U5	.75.50
Conshohocken, Pa. A3	.82.50
Detroit R7	.78.50
Enzley, Ala. T2	.75.50
Fairfield, Ala. T2	.75.50
Fontana, Calif. K1	.83.50
Gary, Ind. U5	.75.50
Johnstown, Pa. B2	.75.50
Lackawanna, N.Y. B2	.75.50
Munhall, Pa. U5	.75.50
So. Chicago, Ill. U5	.75.50
So. Duquesne, Pa. U5	.75.50

## Alloy, Forging (INT)

Bethlehem, Pa. B2	\$.82.00
Buffalo R2	.82.00
Canton, O. R2, T7	.82.00
Conshohocken, Pa. A3	.89.00
Detroit R7	.84.00
Fontana, Calif. K1	.101.00
Gary, Ind. U5	.82.00
Houston S5	.90.00
Ind. Harbor, Ind. Y1	.82.00
Johnstown, Pa. B2	.82.00
Lackawanna, N.Y. B2	.82.00
Los Angeles B3	.102.00
Munhall, O. R2	.82.00
Midland, Pa. C18	.82.00
Munhall, Pa. U5	.82.00
So. Chicago, Ill. U5	.82.00
So. Duquesne, Pa. U5	.82.00
So. San Francisco B3	.85.00

## Alloy, Forging (INT)

Alliquippa, Pa. J5	\$.82.00
Bessemer, Ala. T2	.82.00
Canton, O. R2, T7	.82.00
Conshohocken, Pa. A3	.89.00
Detroit R7	.84.00
Fontana, Calif. K1	.101.00
Gary, Ind. U5	.82.00
Houston S5	.90.00
Ind. Harbor, Ind. Y1	.82.00
Johnstown, Pa. B2	.82.00
Lackawanna, N.Y. B2	.82.00
Los Angeles B3	.102.00
Munhall, O. R2	.82.00
Midland, Pa. C18	.82.00
Munhall, Pa. U5	.82.00
So. Chicago, Ill. U5	.82.00
So. Duquesne, Pa. U5	.82.00
So. San Francisco B3	.85.00

## ROUND, SEAMLESS TUBE (INT)

Bethlehem, Pa. B2	\$.92.00
Buffalo R2	.92.00
Canton, O. R2, T7	.92.00
Conshohocken, Pa. A3	.92.00
Detroit R7	.94.00
Fontana, Calif. K1	.101.00
Gary, Ind. U5	.82.00
Houston S5	.90.00
Ind. Harbor, Ind. Y1	.82.00
Johnstown, Pa. B2	.82.00
Lackawanna, N.Y. B2	.82.00
Los Angeles B3	.102.00
Munhall, O. R2	.82.00
Midland, Pa. C18	.82.00
Munhall, Pa. U5	.82.00
So. Chicago, Ill. U5	.82.00
So. Duquesne, Pa. U5	.82.00
So. San Francisco B3	.85.00

## H.S., L.A. Stand. Shapes

Alliquippa, Pa. J5	.61.75
Bessemer, Ala. T2	.61.75
Canton, O. R2	.61.75
Conshohocken, Pa. A3	.89.00
Detroit R7	.84.00
Fontana, Calif. K1	.101.00
Gary, Ind. U5	.82.00
Houston S5	.90.00
Ind. Harbor, Ind. Y1	.82.00
Johnstown, Pa. B2	.82.00
Lackawanna, N.Y. B2	.82.00
Los Angeles B3	.102.00
Munhall, O. R2	.82.00
Midland, Pa. C18	.82.00
Munhall, Pa. U5	.82.00
So. Chicago, Ill. U5	.82.00
So. Duquesne, Pa. U5	.82.00
So. San Francisco B3	.85.00

## H.S., L.A. Wide Flange

Bethlehem, Pa. B2	.62.00
Lackawanna, N.Y. B2	.62.00
Munhall, Pa. U5	.61.25
So. Chicago, Ill. U5	.61.25

## PILING Bearing Piles

Munhall, Pa. U5	.41.10
So. Chicago, Ill. U5	.41.10
STEEL SHEET PILING	
Ind. Harbor, Ind. I-2	.49.25
Lackawanna, N.Y. B2	.49.25
Munhall, Pa. U5	.49.25
So. Chicago, Ill. U5	.49.25

## PLATES, Carbon Steel

AlabamaCity, Ala. R2	.45.25
Alliquippa, Pa. J5	.45.25
Alton, Ill. L1	.47.00
Bessemer, Ala. T2	.47.00
Buffalo W12	.45.25
Cleveland A7	.45.25
Donora, Pa. A7	.45.25
Fairfield, Ala. T2	.45.25
Fontana, Calif. K1	.45.25
KansasCity, Mo. S5	.48.65
Kokomo, Ind. C16	.46.25
Los Angeles B3	.53.25
Minnequa, Colo. C10	.47.75
Munenessen, Pa. P7	.45.25
No. Tonawanda, N.Y. B11	.45.25
Pittsburg, Calif. C11	.51.75
Portsmouth P12	.45.25

## WIRE RODS

AlabamaCity, Ala. R2	.45.25
Alliquippa, Pa. J5	.45.25
Alton, Ill. L1	.47.00
Bessemer, Ala. T2	.47.00
Buffalo W12	.45.25
Cleveland A7	.45.25
Conshohocken, Pa. A3	.45.25
Fairfield, Ala. T2	.45.25
Fontana, Calif. K1	.45.25
KansasCity, Mo. S5	.48.65
Kokomo, Ind. C16	.46.25
Los Angeles B3	.53.25
Minnequa, Colo. C10	.47.75
Munenessen, Pa. P7	.45.25
No. Tonawanda, N.Y. B11	.45.25
Pittsburg, Calif. C11	.51.75
Portsmouth P12	.45.25

## STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on page 213. Key to footnotes, page 215.

## STRUCTURALS

## Carbon Steel Stand. Shapes

AlabamaCity, Ala. R2	.41.10
Alliquippa, Pa. J5	.41.10
Bessemer, Ala. T2	.41.10
Canton, O. U5	.41.10
Fairfield, Ala. T2	.41.10
Fontana, Calif. K1	.41.10
Seattle B3	.50.00
Sharon, Pa. S3	.41.10
Youngstown R2, U5, Y1	.41.10

So. Chicago, Ill. U5, W14	.41.10
So. Duquesne, Pa. U5	.41.10
So. San Francisco B3	.41.10
Youngstown U5	.41.10
Worlton, W.Va. W6	.41.10

LoneStar, Tex. L6	.41.40
Minnequa, Colo. C10	.41.45
Munhall, Pa. U5	.41.40
Pittsburgh J5	.41.40
Riverville, Ill. A1	.41.40

Seattle, O. Y1	.41.40
St. Louis, Mo. M5	.41.40
Springfield, Ill. P13	.41.40
Worlton, W.Va. W6	.41.40
Youngstown, F3, Y1	.41.40

Worlton, W.Va. W6	.41.40
Youngstown, F3, Y1	.41.40
Youngstown U5	.41.40
Youngstown(31) R2	.41.40
Youngstown(31) R2	.41.40

Youngstown(31) R2	.41.40

Youngstown(31) R2	.41.40

Youngstown(31) R2	.41.40

Youngstown(31) R2	.41.40

Youngstown(31) R2	.41.40

Youngstown(31) R2	.41.40

Youngstown(31) R2	.41.40

Youngstown(31) R2	.41.40
Youngstown(31) R2	.41.4



STRIP, Cold-Finished	0.26-	0.41-	0.61-	0.81-	1.06-
Spring Steel (Annealed)	0.40C	0.60C	0.80C	1.05C	1.35C
Bridges, Conn. (10) S15	5.45	7.65	8.60	10.55	12.85
Bristol, Conn. W1	...	8.90	10.55	...	...
Carnegie, Pa. S18	...	7.65	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
Cleveland, O. C7	8.00	8.60	10.55	...	12.85
Dearborn, Mich. D3	5.65	7.85	8.60	10.55	...
Detroit D2	5.65	7.85	8.60	10.55	...
Dover, O. G6	5.45	7.65	8.60	10.55	12.85
Franklin Park, Ill. T6	5.70	7.80	8.75	10.70	13.00
Harrison, N.J. C18	...	8.90	10.65	13.15	...
Indianapolis C8	7.80	8.60	10.55	...	...
Mattapan, Mass. T6	6.10	7.95	8.60	10.55	13.15
New Britain, Conn. (10) S15	5.75	7.65	8.60	10.55	12.85
New Castle, Pa. B4	5.45	7.65	8.60	10.55	...
New Castle, Pa. E5	5.45	8.00	8.60	10.55	12.85
New Haven, Conn. D2	5.90	7.95	8.60	10.55	...
New York W3	...	7.95	8.60	10.55	13.15
Pawtucket, R.I. (11) N8	...	7.65	8.60	10.55	12.85
Pawtucket, R.I. (12) N8	6.10	7.95	8.60	10.55	13.15
Sharon, Pa. S3	5.45	7.65	8.60	10.55	12.85
Trenton, N.J. R5	7.95	8.60	10.55	13.15	...
Wallingford, Conn. W2	5.90	7.95	8.60	10.55	13.15
Warren, O. T5	5.45	7.65	8.60	10.55	12.85
Weirton, W. Va. W6	5.45	7.65	8.60	10.55	12.85
Worcester, Mass. A7	6.30	7.95	8.60	10.55	13.15
Worcester, Mass. T6	6.10	7.95	8.60	10.55	13.15
Youngstown C8	...	7.65	8.60	10.55	12.85
Spring Steel (Tempered)					
Buffalo W12	...	12.50	...	...	...
Bristol, Conn. W1	...	12.50	15.00	...	...
Franklin Park, Ill. T6	...	13.25	15.75	18.75	...
Harrison, N.J. C18	...	12.50	15.00	18.00	...
New York W3	...	12.50	15.00	18.00	...
Trenton, N.J. R5	...	12.50	15.00	18.00	...
Wallingford, Conn. W2	...	12.50	15.00	18.00	...
Warren, O. T5	...	12.50	15.00	18.00	...
Weirton, W. Va. W6	...	12.50	15.00	18.00	...
Worcester, Mass. A7	...	12.50	15.00	18.00	...
Youngstown C8	...	12.85	15.35	18.35	...

## SILICON STEEL

H.R. SHEETS (22 gage)

(Cut Lengths)

Field	Arma-	Elec-	Dyna-	
ture	tric	Motor	mo	
Beech Bottom, W. Va. W10	...	8.75	9.75	
Brackenridge, Pa. A4	...	8.75	9.75	
Indiana Harbor, Ind. I-2	7.85	8.15	9.75	
Mansfield, O. E6	7.85	8.15	9.75	
Newport, Ky. N9	7.85	8.15	9.75	
Niles, O. N12	7.85	8.15	9.75	
Vandergrift, Pa. U5	8.05	8.75	9.75	
Warren, O. R2	8.05	8.75	9.75	
Zanesville, O. A10	8.15	8.75	9.75	
C.R. COILS & CUT LENGTHS (22 Ga.)				
Fully Processed (semi processed 1/2 lower)				
Field	Arma-	Elec-	Dyna-	
9.25*	8.60*	9.20*	10.20*	
Indiana Harbor, Ind. I-2	8.05	8.40*	9.00*	
Vandergrift, Pa. U5	8.05*	8.90	8.50	
Warren, O. R2	8.05*	8.90	9.50	
H.R. SHEETS (22 Gage) (Cut Lengths)				
Field	Arma-	Elec-	Dyna-	
9.25*	8.60*	9.20*	10.20*	
Brackenridge, Pa. A4	11.60	...	...	
Newport, Ky. N9	11.60	...	...	
Vandergrift, Pa. U5	11.60	12.15	12.65	
Zanesville, O. A10	11.60	12.15	12.65	
C.R. COILS & CUT LENGTHS (22 Ga.)				
Transformer Grade	T-72	T-65	T-58	T-52
Beech Bottom, W. Va. W10	11.60	12.15	12.65	13.65
Brackenridge, Pa. A4	11.60	...	...	...
Newport, Ky. N9	11.60	...	...	...
Vandergrift, Pa. U5	11.60	12.15	12.65	13.65
Zanesville, O. A10	11.60	12.15	12.65	13.65

Field	Arma-	Elec-	Dyna-	
9.25*	8.60*	9.20*	10.20*	
Brackenridge, Pa. A4	8.05	8.40*	9.00*	
Indiana Harbor, Ind. I-2	8.05*	8.90	8.50	
Vandergrift, Pa. U5	8.05*	8.90	9.50	
Warren, O. R2	8.05*	8.90	9.50	
H.R. SHEETS (22 Gage) (Cut Lengths)				
T-100	T-90	T-80	T-73	T-72
Butler, Pa. A10	16.25	18.75	...	...
Vandergrift, Pa. U5	13.65	14.65	18.25	18.75
Warren, O. R2	13.65	14.65	18.25	18.75
* Semiprocessed. † Fully processed only. ‡ Coils annealed; semiprocessed 1/2 lower.				

## TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)

Aliquippa, Pa. J5	0.25 lb	0.50 lb	0.75 lb
Fairfield, Ala. T2	\$7.40	\$7.65	\$8.05
Fairfield, Ala. T3	7.50	7.75	8.15
Fairless, Pa. U5	7.50	7.75	8.15
Gary, Ind. U5	7.40	7.65	8.05
Granite City, Ill. G4	7.80	7.85	8.25
Irvin, Pa. U5	7.40	7.65	8.05
Niles, O. R2	7.40	7.65	8.05
Pittsburgh, Calif. C11	8.15	8.40	8.80
Sparrows Point, Md. B2	7.50	7.75	8.15
Weirton, W. Va. W6	7.40	7.65	8.05
Yorkville, O. W10	7.40	7.65	8.05

TIN PLATE, American 1.25 1.50 1.75 2.00

Coke (Base Box) lb lb lb lb

Aliquippa, Pa. J5 \$5.80 \$8.95

Fairfield, Ala. T2 8.80 9.05

Fairless, Pa. U5 8.80 9.05

Gary, Ind. U5 8.70 9.05

Ind. Har. I-2, Y1. 8.70 8.95

Granite City, Ill. G4 8.95 9.05

Irvin, Pa. U5 8.70 9.05

Pitts., Cal. C11 9.45 9.70

Sp. Pt., Md. B2 8.80 9.05

Warren, O. R2 8.70 8.95

Yorkville, O. W10 8.70 8.95

TIN PLATE, American 1.25 1.50 1.75 2.00

(Special Coated) Fairfield, Ala. T2 8.70 8.95

Gary, Ind. U5 8.70 8.95

Ind. Har. I-2, Y1. 8.70 8.95

Granite City, Ill. G4 8.70 9.05

Irvin, Pa. U5 8.70 9.05

Pitts., Cal. C11 8.70 9.05

Warren, O. R2 8.70 8.95

Yorkville, O. W10 8.70 8.95

TIN PLATE, American 1.25 1.50 1.75 2.00

(Special Coated) 6 lb lb lb lb

Aliquippa, Pa. J5 \$8.50

Fairfield, Ala. T2 8.80

Gary, Ind. U5 8.80

Ind. Har. I-2, Y1. 8.80

Granite City, Ill. G4 8.80

Irvin, Pa. U5 8.80

Pitts., Cal. C11 8.80

Warren, O. R2 8.80

Yorkville, O. W10 8.80

TIN PLATE, American 1.25 1.50 1.75 2.00

(Special Coated) 6 lb lb lb lb

Aliquippa, Pa. J5 \$8.50

Fairfield, Ala. T2 8.80

Gary, Ind. U5 8.80

Ind. Har. I-2, Y1. 8.80

Granite City, Ill. G4 8.80

Irvin, Pa. U5 8.80

Pitts., Cal. C11 8.80

Warren, O. R2 8.80

Yorkville, O. W10 8.80

TIN PLATE, American 1.25 1.50 1.75 2.00

(Special Coated) 6 lb lb lb lb

Aliquippa, Pa. J5 \$8.50

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Gary, Ind. U5 8.80

Ind. Har. I-2, Y1. 8.80

Granite City, Ill. G4 8.80

Irvin, Pa. U5 8.80

Pitts., Cal. C11 8.80

Warren, O. R2 8.80

Yorkville, O. W10 8.80

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(Special Coated) 6 lb lb lb lb

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Yorkville, O. W10 8.80

TIN PLATE, American 1.25 1.50 1.75 2.00

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Ind. Har. I-2, Y1. 8.80

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Irvin, Pa. U5 8.80

Pitts., Cal. C11 8.80

Warren, O. R2 8.80

Yorkville, O. W10 8.80

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Irvin, Pa. U5 8.80

Pitts., Cal. C11 8.80

Warren, O. R2 8.80

Yorkville, O. W10 8.80

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Aliquippa, Pa. J5 \$8.50

Fairfield, Ala. T2 8.80

Gary, Ind. U5 8.80

Ind. Har. I-2, Y1. 8.80

Granite City, Ill. G4 8.80

Irvin, Pa. U5 8.80

Pitts., Cal. C11 8.80

Warren, O. R2 8.80

Yorkville, O. W10 8.80

TIN PLATE, American 1.25 1.50 1.75 2.00

(Special Coated) 6 lb lb lb lb

Aliquippa, Pa. J5 \$8.50

Fairfield, Ala. T2 8.80

Gary, Ind. U5 8.80

Ind. Har. I-2, Y1. 8.80

Granite City, Ill. G4 8.80

Irvin, Pa. U5 8.80

Pitts., Cal. C11 8.80

Warren, O. R2 8.80

Yorkville, O. W10 8.80

TIN PLATE, American 1.25 1.50 1.75 2.00

(Special Coated) 6 lb lb lb lb

Aliquippa, Pa. J5 \$8.50

Fairfield, Ala. T2 8.80

Gary, Ind. U5 8.80

Ind. Har. I-2, Y1. 8.80

Granite City, Ill. G4 8.80

Irvin, Pa. U5 8.80

Pitts., Cal. C11 8.80

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Ind. Har. I-2, Y1. 8.80

Granite City, Ill. G4 8.80

Irvin, Pa. U5 8.80

Pitts., Cal. C11 8.80

Warren, O. R2 8.80

Yorkville, O. W10 8.80

TIN PLATE, American 1.25 1.50 1.75 2.00

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Fairfield, Ala. T2 8.80

Gary, Ind. U5 8.80

Ind. Har. I-2, Y1. 8.80

Granite City, Ill. G4 8.80

Irvin, Pa. U5 8.80

Pitts., Cal. C11 8.80

Warren, O. R2 8.80

## AMLESS STANDARD PIPE, Threaded and Coupled

Inches				2 1/2				3				3 1/2				4				5				6			
Per Ft	37c	58.5c	76.5c	92c	1.09	\$1.48	1.81	1.92	25.5	5.75	28	5.75	25.5	8.25	19.18	1.81	1.92	25.5	8.25	19.18	1.81	1.92	25.5	8.25			
nds Per Ft	3.68	5.82	7.62	9.20	10.89																						
Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv			
uippa, Pa. J5 (t)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23.75	6.5	23.75	6.5	23.75	6.5	23.75	6.5	23.75	6.5	23.75	6.5	23.75	6.5	23.75		
ridge, Pa. M2 (t)	18.75		19.75	...	22.25	...	23.75	...	23.75	...	23.75	...	23.75	...	23.75	...	23.75	...	23.75	...	23.75	...	23.75	...	23.75		
ain, O. N3 (*)	18.75	4.5	19.75	5.5	22.25	8	23.75	9.5	23.75	9.5	23.75	9.5	23.75	9.5	23.75	9.5	23.75	9.5	23.75	9.5	23.75	9.5	23.75	9.5	23.75		
ngstown Y1 (t)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23.75	6.5	23.75	6.5	23.75	6.5	23.75	6.5	23.75	6.5	23.75	6.5	23.75	6.5	23.75		

## CTRIC WELD STANDARD PIPE, Threaded and Coupled

Inches				2 1/2				3				3 1/2				4				5				6				
Per Ft	37c	58.5c	76.5c	92c	1.09	\$1.48	1.81	1	1 1/4	2 3/4	27.5c	1.15c	1.13	1.68	1	1 1/4	2 3/4	27.5c	1.15c	1.13	1.68	1	1 1/4	2 3/4	27.5c	1.15c	1.13	1.68
nds Per Ft	3.68	5.82	7.62	9.20	10.89																							
Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv			
uippa, Pa. J5 (t)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23.75	6.5	23.75	6.5	23.75	6.5	23.75	6.5	23.75	6.5	23.75	6.5	23.75	6.5	23.75	6.5	23.75	
n, Ill. L1 (\$)	18.75		24.25	9	27.25	13	29.75	16.5	32.25	17.5	34.25	18.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	
wood, W. Va. W10 (t)	25.5	+0.25	17.75	+5.5	10.25	+10	26.25	11	29.25	15	31.75	18.5	34.25	18.5	34.25	18.5	34.25	18.5	34.25	18.5	34.25	18.5	34.25	18.5	34.25	18.5	34.25	
er, Pa. F6	26.5	-1.75	19.5	+2.75	12.5	+6.25	26.25	7	29.25	11	31.75	14.5	34.25	16.25	34.75	17.25	34.75	17.25	34.75	17.25	34.75	17.25	34.75	17.25	34.75	17.25	34.75	
Pa. N2 (t)	...	...	...	...	...	...	24.25	9	27.25	13	29.75	16.5	32.25	17.5	34.25	18.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	
less, Pa. N3	...	...	...	...	...	...	24.25	9	27.25	13	29.75	16.5	32.25	17.5	34.25	18.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	
ana, Calif. K1 (\$)	...	...	...	...	...	...	24.25	9	27.25	13	29.75	16.5	32.25	17.5	34.25	18.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	
Harbor, Y1 (t)	...	...	...	...	...	...	24.25	9	27.25	13	29.75	16.5	32.25	17.5	34.25	18.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	
on, Pa. S4 (t)	26.5	-0.25	19.50	+4.25	12.5	+8.5	26.25	11	29.25	15	31.75	18.5	34.25	16.25	34.75	17.25	34.75	17.25	34.75	17.25	34.75	17.25	34.75	17.25	34.75	17.25	34.75	
on, Pa. M6	...	...	...	...	...	...	24.25	9	27.25	12	29.75	15.5	32.25	16.5	34.25	18.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	
rows Pt., Md. B2 (\$)	24.5	+1.75	17.5	+6.25	10.5	+10.5	24.25	8	27.25	12	29.75	15.5	32.25	16.5	34.25	18.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	
ngstown R2 (t)	...	...	...	...	...	...	24.25	12	29.25	16	31.75	19.5	34.25	20.0	34.75	21.0	34.75	21.0	34.75	21.0	34.75	21.0	34.75	21.0	34.75	21.0	34.75	
ngstown Y1 (t)	35.25	20	17.5	+6.25	10.5	+10.5	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	
atland, Pa. W9 (\$)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	19.5	34.75	

Galvanized pipe discounts based on zinc price of: (t), 14c; (t), 11c to under 12c; (\*), 5c; (\$), 10c to under 11c; 10.50c-11.50c; (\*\*), 9.50c; with discounts adjusted on price of zinc at time of shipment.

## LER TUBES

Inches				2 1/2				3				3 1/2				4				5				6				
Per Ft	37c	58.5c	76.5c	92c	1.09	\$1.48	1.81	1	1 1/4	2 3/4	27.5c	1.15c	1.13	1.68	1	1 1/4	2 3/4	27.5c	1.15c	1.13	1.68	1	1 1/4	2 3/4	27.5c	1.15c	1.13	1.68
nds Per Ft	3.68	5.82	7.62	9.20	10.89																							
Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv		
uippa, Pa. J5 (t)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
n, Ill. L1 (\$)	33.25	18.75	34.75	18	34.75	18	34.75	18	34.75	18	34.75	18	34.75	18	34.75	18	34.75	18	34.75	18	34.75	18	34.75	18	34.75	18	34.75	18
wood, W. Va. W10 (t)	35.25	20.75	36.75	20.5	36.75	20.5	36.75	20.5	36.75	20.5	36.75	20.5	36.75	20.5	36.75	20.5	36.75	20.5	36.75	20.5	36.75	20.5	36.75	20.5	36.75	20.5	36.75	
Pa. N2 (t)	35.25	17.25	36.75	17.5	36.75	17.5	36.75	17.5	36.75	17.5	36.75	17.5	36.75	17.5	36.75	17.5	36.75	17.5	36.75	17.5	36.75	17.5	36.75	17.5	36.75	17.5	36.75	
less, Pa. N3	33.25	17.25	34.75	17.5	34.75	17.5	34.75	17.5	34.75	17.5	34.75	17.5	34.75	17.5	34.75	17.5	34.75	17.5	34.75	17.5	34.75	17.5	34.75	17.5	34.75	17.5	34.75	
ana, Calif. K1 (\$)	24.25	7	23.75	7	23.75	7	23.75	7	23.75	7	23.75	7	23.75	7	23.75	7	23.75	7	23.75	7	23.75	7	23.75	7	23.75	7	23.75	7
Harbor, Ind. Y1 (t)	34.25	19	35.75	19	35.75	19	35.75	19	35.75	19	35.75	19	35.75	19	35.75	19	35.75	19	35.75	19	35.75	19	35.75	19	35.75	19	35.75	19
on, Pa. M6	35.25	24.5	36.75	23	36.75	23	36.75	23	36.75	23	36.75	23	36.75	23	36.75	23	36.75	23	36.75	23	36.75	23	36.75	23	36.75	23	36.75	23
rows Pt., Md. B2 (\$)	32.25	18	34.75	18	34.75	18	34.75	18	34.75	18	34.75	18	34.75	18	34.75	18	34.75	18	34.75	18	34.75	18	34.75	18	34.75	18	34.75	18
Blank	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Step, Elevator, Tap and Sleigh Shoe	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Boiler & Fitting-Up Bolts	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

## ILWAY MATERIALS

Std. No. 1	Std. No. 2	Std. No. 2 Under	Std. Tee Rails
sem, Pa. U5	19.02	18.44	
ley, Ala. T2	22.53	18.12	
field, Ala. T2	20.65	20.01	
y, Ind. U5	24.91	23.66	
ington, W. Va. W7	24.40	23.66	
anaHarbor, Ind. I-2	27.34	32.98	
on, Pa. B2	30.80	37.15	
33.43	40.32	32.41	
36.82	44.41	35.70	
39.87	48.09	38.66	
42.52	51.28	41.23	

## STANDARD TRACK SPIKES

Fairfield, Ala. T2	7.05		


<tbl\_r cells="4" ix="2" maxcspan="1" maxrspan="1"

## STAINLESS STEEL MILL PRICES

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Slabs, Billets	Forging Billets	Tube Billets	H.R. Strip	Shapes: H.R. & C.F.			C.R. Strip; Flat Wire
						Bars;	Sheets	Wire	
301	16.25	20.50	29.50	34.25	29.75	36.25	37.25	48.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	46.50	41.50
302B	18.50	24.50	30.50	34.50	35.00	35.50	37.50	48.75	44.75
303	18.75	24.75	32.25	37.25	38.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	48.75	43.75
304L	18.25	23.75	31.00	36.00	34.25	37.25	39.75	48.75	43.75
306	19.50	25.50	36.25	37.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	55.25	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	63.50	62.00
309S	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	67.50	67.50	69.00	72.25	78.75
314	28.00	36.25	46.75	54.50	55.00	55.50	59.00	64.50	66.50
316	32.25	52.50	66.75	87.50	61.00	64.25	70.00	72.00	72.00
317	33.00	43.50	58.25	68.75	67.50	68.25	70.75	77.00	79.25
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	78.00	80.25
321	22.75	29.50	35.25	40.75	42.00	42.00	46.00	55.50	54.50
330	24.50	32.25	39.50	45.75	46.50	46.75	51.25	60.75	59.25
347	27.00	30.75	33.00	34.25	34.00	34.25	44.00	41.25	41.25
403	25.25	29.25	30.50	32.25	31.75	42.50	39.75	40.75	39.75
405	16.50	21.75	24.00	27.75	26.25	28.75	30.00	40.75	34.25
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	40.75	41.25
416	24.50	28.25	30.50	32.25	31.75	33.50	35.00	40.75	42.75
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	49.25	52.75
430	18.50	24.50	25.25	27.00	28.25	30.50	34.50	34.75	34.75
430F	18.75	25.00	28.75	29.75	31.00	44.00	44.00	44.00	44.00
431	28.50	25.00	28.25	27.50	29.25	30.50	44.00	44.00	35.25
440A,B,C	28.50	29.25	34.00	35.00	35.00	38.50	49.25	52.75	52.75
442	28.00	30.50	32.25	33.00	33.00	35.25	46.25	47.75	47.75
446	33.75	38.25	53.00	39.50	40.75	59.75	71.00	71.00	71.00
501	14.00	14.50	21.25	16.00	18.25	30.50	30.50	30.00	29.00
502	15.25	18.00	22.25	17.00	20.00	31.75	31.75	30.00	29.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Irvins Steel Tube Works Inc.; First Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div.; Borg Warner Corp.; JESSOP Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotarty Electric Steel Co.; Sharon Steel Corp.; Shenango Agalyo Tube Co.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Fred Ulrich & Sons; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

**PIG IRON** F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	No. 2 Basic	Foundry	Malleable	Bessemer
Birmingham District				
Alabama City R2	52.38	52.88	52.88	56.50
Birmingham R2	52.38	52.88	52.88	56.50
Birmingham U6	52.38	52.88	52.88	57.00
Woodward, Ala. W15	62.38	52.88	56.50†	61.90
Cincinnati, del.	60.43	.....	.....	61.90

**Buffalo District**

	No. 2 Basic	Foundry	Malleable	Bessemer
Buffalo R2, H1	56.00	56.50	57.00	56.50
Tonawanda, N.Y. W12	56.00	56.50	57.00	56.50
No. Tonawanda, N.Y. T9	56.00	56.50	57.00	57.00
Boston, del.	66.65	67.15	67.65	65.00
Rochester, N.Y., del.	59.02	59.52	60.02	59.50
Syracuse, N.Y., del.	60.12	60.62	61.12	60.62

**Chicago District**

	No. 2 Basic	Foundry	Malleable	Bessemer
Chicago I-3	56.00	56.50	56.50	57.00
Gary, Ind. U5	56.00	.....	56.50	56.50
Indiana Harbor, Ind. I-2	56.00	.....	56.50	56.50
So. Chicago, Ill. W14, Y1	56.00	56.50	56.50	57.00
So. Chicago, Ill. U6	56.00	.....	56.50	57.00
Milwaukee, del.	58.17	58.67	58.67	59.17
Muskegon, Mich., del.	62.80	62.80	62.80	62.80

**Cleveland District**

	No. 2 Basic	Foundry	Malleable	Bessemer
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	57.00
Akron, O., del. from Cleve.	58.75	59.25	59.25	59.75
Lorain, O. N3	56.00	.....	.....	57.00

**Mid-Atlantic District**

	No. 2 Basic	Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	58.00	58.50	59.00	59.50
New York, del.	62.28	62.78	62.78	62.78
Birdsboro, Pa. B10	61.02	61.52	62.02	62.52
Steeltown, Pa. B2	58.00	58.50	58.50	58.50
Swedeland, Pa. A3	58.00	58.50	58.00	59.50
Philadelphia, del.	59.66	60.16	60.66	61.16
Troy, N.Y. R2	58.00	58.50	59.00	59.00

**Pittsburgh District**

	No. 2 Basic	Foundry	Malleable	Bessemer
Neville Island, Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Ambridge, Alliquippe, del.	57.37	57.87	57.87	58.37
McKee Rocks, del.	57.04	57.54	57.54	58.04
Lawrenceville, Homestead, Wilmerding, Monaca, del.	57.66	58.16	58.16	58.66
Verona, Trafford, del.	58.19	58.69	58.69	59.19
Brackenridge, del.	58.45	58.95	58.95	59.45
Bessemer, Pa. U5	56.00	.....	56.50	57.00

	No. 2 Basic	Foundry	Malleable	Bessemer
Clairton, Rankin, So. Duquesne, Pa. U5	56.00	.....	56.50	57.00
McKeesport, Pa. N6	56.00	.....	56.50	57.00
Midland, Pa. C18	56.00	.....	56.50	57.00
Monessen, Pa. P7	56.00	.....	56.50	57.00

**CLAD STEEL**

Cladding	Stainless	Plates		Sheets
		10%	20%	
302	.....	.....	31.00	31.00
304	.....	27.60	32.50-32.70	77.00
310	.....	36.50	41.00	144.00
316	.....	32.60	37.70-42.75	42.75
318	.....	37.00	42.20	111.00
321	.....	29.80	34.40-37.00	37.00
330	.....	36.75	40.50-40.50	40.50
347	.....	32.25	36.60	130.00
348	.....	36.75	40.50	46.00
349	.....	36.75	40.50	46.00
350	.....	36.75	40.50	46.00
351	.....	36.75	40.50	46.00
352	.....	36.75	40.50	46.00
353	.....	36.75	40.50	46.00
354	.....	36.75	40.50	46.00
355	.....	36.75	40.50	46.00
356	.....	36.75	40.50	46.00
357	.....	36.75	40.50	46.00
358	.....	36.75	40.50	46.00
359	.....	36.75	40.50	46.00
360	.....	36.75	40.50	46.00
361	.....	36.75	40.50	46.00
362	.....	36.75	40.50	46.00
363	.....	36.75	40.50	46.00
364	.....	36.75	40.50	46.00
365	.....	36.75	40.50	46.00
366	.....	36.75	40.50	46.00
367	.....	36.75	40.50	46.00
368	.....	36.75	40.50	46.00
369	.....	36.75	40.50	46.00
370	.....	36.75	40.50	46.00
371	.....	36.75	40.50	46.00
372	.....	36.75	40.50	46.00
373	.....	36.75	40.50	46.00
374	.....	36.75	40.50	46.00
375	.....	36.75	40.50	46.00
376	.....	36.75	40.50	46.00
377	.....	36.75	40.50	46.00
378	.....	36.75	40.50	46.00
379	.....	36.75	40.50	46.00
380	.....	36.75	40.50	46.00
381	.....	36.75	40.50	46.00
382	.....	36.75	40.50	46.00
383	.....	36.75	40.50	46.00
384	.....	36.75	40.50	46.00
385	.....	36.75	40.50	46.00
386	.....	36.75	40.50	46.00
387	.....	36.75	40.50	46.00
388	.....	36.75	40.50	46.00
389	.....	36.75	40.50	46.00
390	.....	36.75	40.50	46.00
391	.....	36.75	40.50	46.00
392	.....	36.75	40.50	46.00
393	.....	36.75	40.50	46.00
394	.....	36.75	40.50	46.00
395	.....	36.75	40.50	46.00
396	.....	36.75	40.50	46.00
397	.....	36.75	40.50	46.00
398	.....	36.75	40.50	46.00
399	.....	36.75	40.50	46.00
400	.....	36.75	40.50	46.00
401	.....	36.75	40.50	46.00



a hole here makes waste...



a hole here makes a saving

**Crucible Hollow Tool Steel Bars** are a boon to the metalworking industry. The hole in these quality bars enable toolmakers to eliminate drilling, boring, cutting-off and rough-facing operations. This cuts production time, boosts machine capacity and saves scrap losses.

They are available now, in any of Crucible's famous tool steel grades, in almost any combination of O.D. and I.D. sizes. And you can get *immediate* delivery of five popular grades — KETOS oil-hardening, SANDERSON water-hardening, AIRDI 150 high carbon-high chromium, AIRKOOL air-hardening, and NU DIE V hot-work tool steels — from a conveniently located Crucible branch warehouse.

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## WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, Erie, St. Paul, 15 cents; Seattle and Spokane, Wash., no charge.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††		Carbon	Floor
Baltimore ....	6.20	7.64	7.78	7.00	...	6.86	8.17*	12.04	6.98	6.85	7.98
Birmingham ....	6.10	7.00	8.00*	6.30	...	6.15	8.90	...	6.35	6.35	8.25
Boston ....	6.89	7.83	9.18	7.13	...	6.87	8.35	12.13	7.06	7.13	8.26
Buffalo ....	6.18	7.15	8.70	6.79	...	6.35	7.70	12.02	6.59	6.68	7.88
Charlotte, N. C.	6.95	7.80	8.69	6.90	...	7.10	8.37	...	7.10	7.10	8.37
Chicago ....	6.18	7.12	7.95	6.42	...	6.28	7.30	11.60	6.46	6.33	7.46
Cincinnati ....	6.30	7.11	8.20	6.66	...	6.52	7.60	11.85	6.64	6.62	7.71
Cleveland ....	6.18	7.12	7.90	6.58	...	6.34	7.40	11.74	6.79	6.50	7.63
Detroit ....	6.38	7.29	8.22	6.69	7.36	6.56	7.60	11.97	6.91	6.80	7.80
Erie, Pa. ....	6.13	...	8.15	6.38	...	6.23	7.50*	...	6.50	6.36	7.79
Houston ....	7.15	7.60	9.23	7.45	9.30	7.45	9.30	...	7.35	7.20	8.55
Los Angeles ..	7.25	9.00	9.35	7.55	11.20	7.15	9.10	13.10	7.35	7.20	9.25
Milwaukee ....	6.35	7.29	8.12	6.59	...	6.45	7.57	11.77	6.63	6.50	7.63
Moline, Ill. ....	6.53	7.47	8.35	6.77	...	6.63	7.65	...	6.81	6.68	...
New York ....	6.78	7.52	8.37	7.16	...	7.06	8.43*	11.99	6.90	6.99	8.30
Norfolk, Va. ....	6.90	...	7.00	...	...	7.00	8.50	...	7.00	7.00	7.85
Philadelphia ....	6.35	7.13	7.87	7.02	8.80	6.87	8.19*	11.74	6.67	6.63	7.66**
Pittsburgh ....	6.18	7.12	8.00	6.55	...	6.28	7.65	11.60	6.46	6.33	7.46
Portland, Oreg. ....	7.90	8.45	9.15	7.65	...	7.35	10.65	...	7.25	7.30	9.15
Richmond, Va. ....	6.50	...	8.67	7.10	...	7.05	8.20	...	7.10	6.85	8.20
St. Louis ....	6.48	7.42	8.25	6.72	...	6.58	7.70	11.90	6.86	6.73	7.86
St. Paul ....	6.84	7.78	8.66	7.08	...	6.94	8.06	...	7.12	6.99	8.12
San Francisco. ....	7.35	8.70	9.30	7.60	...	7.15	9.75	12.90	7.25	7.20	9.25
Seattle ....	8.15	9.50	9.80	8.00	...	7.60	10.65	13.50	7.50	7.60	9.40
Spokane ....	8.15	9.40†	9.80	7.60	...	7.60	10.55*	14.15	7.25	7.35	9.40
Washington ...	6.71	7.65	8.35	7.51	...	7.37	8.43	...	7.49	7.36	8.49

\*Prices do not include gage extras; †prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extras excluded); \*\*includes 35-cent special bar quality extra; §as rolled; \*\*½-in. and heavier, add 0.34c for 12 gage and lighter. ††as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, and cold-finished bars, 2000 lb and over, except in Seattle where base is 2000 to 9999 lb; 2—500 to 9999 lb; 5—1000 to 1999 lb; 10—1000 lb and over; 15—1500 lb to 3999; 20—under ½ in.

## Warehouse Steel Demand Holds Steady

Numerous small-tonnage orders sustain turnover at about first-quarter volume. Price weakness is evident in some districts, but it fails to unsettle market

**Cleveland**—Warehouse order volume is disappointing but it is better than a month or two back and seasonal influences are expected to boost April bookings substantially.

First quarter volume of the warehouses over the country was under that of the like period a year ago. However, February business bettered that in January by 4 to 5 per cent, over-all, and indications are March volume was up from that of February.

Sheets and strip appear to be about the slowest moving items carried by the warehouses at present. It is reported volume is off 35 to 40 per cent from a year ago. Plates and shapes, however, are moving at a good rate. February business in plates, shapes and bars was reported up 7 per cent from February, with cold-finished bars up 3 per cent.

**New York**—Warehouse distributors are working down inventories. Diversity of small orders helps. Volume has levelled off without much improvement over first quarter daily totals. Orders are largely for fill-in requirements.

of possible revisions, but no action may be taken until sellers see what the truckers may do as regards rates now that eastern rail rates have been reduced. Softness in the warehouse market, however, continues to be reflected by the cutting of extras.

**Chicago** — Warehouse steel sales are holding fairly steady. Numerically, purchases and aggregate tonnage remain about the same as a month ago.

**Pittsburgh**—April sales promise to be slightly above March. Distributors report an increasing number of

## STEEL IMPORT PRICES

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast*
Deformed Bars, Intermediate, ASTM-A-305...	\$4.55	\$4.55	\$4.50	\$4.83
Bar Size Angles .....	4.40	4.40	4.35	4.68
Structural Angles .....	4.40	4.40	4.35	4.68
I-Beams .....	4.40	4.40	4.35	4.68
Wide Flange Beams .....	4.80	4.80	4.80	5.08
Sheet and Plate, 10 gage, 11 gage, 5' x 10' .....	5.50	5.50	5.45	5.78
Furring Channels, C.R., 1000 ft, ½" x 0.30 lb per ft .....	25.50	25.70	25.50	28.34
Barbed Wire .....	6.60	6.60	6.60	6.68
Merchant Bars .....	4.55	4.55	4.50	4.83
Hot Rolled Bands .....	4.70	4.70	4.65	4.98
Wire Rods, Thomas Commercial No. 5 .....	4.77	4.84	4.82	5.09
Wire Rods, O-H, Cold Heading Quality No. 5 .....	5.23	5.30	5.28	5.55
Bright Common Wire Nails, 8d .....	6.55	6.65	6.60	6.85

\*Not including \$2.20 per net ton customarily charged in most West Coast ports for wharfage and handling.

Size O.D.	Wgt./Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55:				
5½ in. ....	15.5	\$1.47/ft	\$1.51/ft	\$1.32/ft
7 in. ....	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in. ....	17	1.94/ft	2.00/ft	1.75/ft
7 in. ....	23	2.50/ft	2.70/ft	2.88/ft
Seamless J-55 Tubing:				
2½ in. ....	4.7	0.60/ft	0.63/ft	0.55/ft
2½ in. ....	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

quiries, especially for plate and structural shapes. Volume of orders for tubular products and cold-finished bars is sufficient to hold prices. San Francisco—Warehouse orders are about as numerous as they were year ago but tonnage involved is smaller.

Seattle—The warehouse trade is hopeful of a good season although April volume has not increased as much as expected.

Cincinnati—Distributors' stocks are out of balance. Even structurals, one item recently in tight supply, are plentiful.

## More Steel Poured in March

New York—Production of ingots and steel for castings in March totaled 7,290,000 net tons, reports the American Iron & Steel Institute. This was an increase of 206,763 tons from the February total of 7,083,237 tons. On a weekly basis, however, March output was under that of February, averaging 1,645,598 tons against 1,770,809 in the preceding month.

Output in first quarter this year amounted to 22,324,723 net tons, or 1.1 per cent higher than the average rate of production during the three years 1947-49.

The Institute states a year's output at the first quarter rate would result in production of more than 70 million net tons of steel. In only four years, it points out, has production exceeded 90 million tons. They were the four years 1950 to 1953, inclusive.

Comparative data are given in the accompanying table.

# Slight Gain Noted in Sheet Bookings

Consumers ordering cautiously but some lines are taking a little more tonnage than in first quarter. Demand for galvanized sheets seasonally more active

### Sheet and Strip Prices, Page 212 & 213

Boston—Flat-rolled specialties, including electrical, enameling and stainless, are slow with the buying pattern parallel to carbon sheet procurement. Orders are fill-in requirements for prompt delivery. Galvanized is showing seasonal improvement. All sheet volume is equalized as to freight with Fairless, Pa. lowest base on carbon grades.

An outstanding cold strip inquiry includes 450 tons of cartridge clip steel, Springfield Arsenal, bids closing April 30 on 350 tons, WD-1045 special, .033—.002-inch, 3½ inch wide.

New York—Although sheet operations are far below capacity, orders show mild improvement. This is especially true in cold sheets, with more going into household appliances and electrical equipment.

Philadelphia—Slightly swelling volume of automotive work is bolstering sheet demand here. Also reflected are an improved, though disappointing, volume of specifications from agricultural equipment builders, and seasonal upswing in air-conditioning needs.

Pittsburgh—Sheet and strip sales are in short term doldrums. Some price weakness is reported by warehouses. Competition for small orders causes mills and warehouses to speed service where possible.

Cleveland—Order volume in sheets and strip is not what producers would like and can handle, but it is holding up much better than demand for some other products, notably bars. Actually, demand for the flat-rolled items continues to provide the major support to steel operations, curtailment of which is due more to the slack in requirements of other products.

Effective April 8, a revised list of extras on silicon sheets and coiled silicon strip was issued by Republic Steel Corp. The new list supersedes one dated May 18, 1953, and includes changes in the silicon gage table, dimensional extras, deoxidizing and width tolerances.

Cincinnati—Warehouse stocks of sheets are plentiful. Competition is keen with distressed stocks being offered.

Detroit—Sheet sales show moderate gains. Still hoped-for is a marked upturn toward end of this month, carrying through the heavy auto buying season just begun.

Chicago—Demand for galvanized sheets outruns that for any other flat-rolled product relatively speaking.

St. Louis—Cold-rolled sheet orders are climbing slowly. Mills are confident April bookings will better March volume, which in turn was better than that in February.

Period	OPEN HEARTH			BESSEMER			ELECTRIC			TOTAL			Calculated weekly production of weeks (Net tons)	Number in month
	Net tons	capacity	Index	Per cent of	Net tons	capacity	Index	Per cent of	Net tons	capacity	Index	Per cent of		
1954														
January	7,256,526	78.3	113.3	260,453	64.0	74.1	434,507	48.9	121.7	7,951,486	75.3	111.8	1,794,918	4.43
February	6,523,213	77.9	112.8	174,253	47.4	54.9	385,771	48.1	119.6	7,083,237	74.3	110.2	1,770,809	4.00
March	6,653,000	71.8	103.9	208,000	51.1	59.2	429,000	48.3	102.1	7,280,000	69.0	102.5	1,646,000	4.43
1st Qtr.	20,432,739	75.9	109.9	642,706	54.4	63.0	1,249,278	48.5	120.5	22,324,723	72.6	108.1	1,755,982	12.86
1953														
January	8,841,679	101.4	138.0	350,200	88.9	99.7	706,083	81.2	197.7	9,897,982	99.1	139.1	2,234,303	4.43
February	7,939,299	100.8	137.2	329,389	92.6	103.8	664,091	84.8	84.6	8,188,098	99.1	139.0	2,233,195	4.00
March	9,050,773	103.7	141.3	354,710	90.0	101.0	762,615	87.7	213.5	10,185,098	101.8	142.9	2,295,282	4.43
1st Qtr.	25,831,751	102.0	138.9	1,034,299	90.4	101.4	2,132,789	84.5	205.7	28,998,839	100.0	140.4	2,254,964	12.86
April	8,493,909	100.5	137.0	334,605	87.7	98.4	717,024	85.2	207.4	9,545,538	98.7	138.7	2,225,067	4.29
May	8,925,163	102.3	139.3	354,577	90.0	100.9	717,340	82.5	200.8	9,997,080	100.1	140.5	2,256,677	4.43
June	8,394,502	99.4	135.4	322,060	87.0	97.7	677,917	80.5	196.1	9,404,479	97.2	138.8	2,192,186	4.29
2nd Qtr.	25,813,574	100.8	137.3	1,021,242	88.3	99.0	2,112,281	82.7	201.5	28,947,097	98.7	138.8	2,224,983	13.01
1st 6 mos.	51,645,325	101.4	138.1	2,055,541	89.3	98.0	4,245,070	83.6	203.6	57,945,936	99.4	139.5	2,239,889	25.87
July	8,316,342	95.5	128.8	324,068	82.4	92.2	635,265	73.2	177.9	9,275,873	93.1	130.4	2,098,589	4.42
August	8,463,155	97.0	132.1	310,074	78.7	88.2	632,351	72.7	177.0	9,405,550	94.2	132.2	2,123,156	4.43
September	8,076,220	95.8	130.3	287,638	75.6	84.6	519,513	61.9	129.0	8,838,428	92.1	129.0	2,075,587	4.28
3rd Qtr.	24,855,774	96.1	130.8	921,780	78.9	88.4	1,787,127	69.4	163.6	27,584,681	93.1	130.6	2,099,386	13.13
9 mos.	76,501,099	99.6	135.6	2,977,321	85.8	96.2	6,032,197	78.8	191.8	85,510,617	97.3	136.5	2,192,580	39.00
October	8,648,428	99.1	135.0	325,250	82.6	92.6	489,044	56.3	136.9	9,462,722	94.7	133.0	2,136,055	4.43
November	8,002,349	94.7	129.1	283,321	74.3	83.3	404,382	48.0	117.0	8,890,052	89.9	126.2	2,025,653	4.29
December	7,321,947	84.1	114.3	268,813	68.6	76.8	354,568	40.9	99.3	7,946,328	79.7	111.7	1,797,812	4.42
4th Qtr.	23,972,724	92.6	126.1	878,384	75.2	84.2	1,247,994	48.4	117.7	28,069,102	88.1	123.6	1,986,233	13.14
2nd 6 mos.	48,823,493	94.4	128.4	1,800,164	77.1	86.3	3,035,121	58.9	143.2	53,663,788	90.6	127.1	2,042,778	26.27
Total	100,473,828	97.9	133.2	3,855,705	83.2	93.2	7,280,191	71.1	173.1	111,609,719	94.9	133.2	2,140,578	52.14

Note—The percentages of capacity operated are calculated on weekly capacities in 1954 of 2,092,342 net tons open hearth, 91,810 net tons bessemer and 200,397 net tons electric ingots and steel for castings, total 2,334,549 net tons; based on annual capacities as of Jan. 1, 1954 as follows: Open hearth 109,044,730 net tons, bessemer 4,787,000 net tons, electric 10,448,680 net tons, total 124,330,410 net tons.

Note—The percentages of capacity operated are calculated on weekly capacities in 1953 of 1,969,275 net tons open hearth, 88,934 net tons bessemer and 196,250 net tons electric ingots and steel for castings, total 2,254,459 net tons; based on annual capacities as of Jan. 1, 1953 as follows: Open hearth 102,677,980 net tons, bessemer 4,637,000 net tons, electric 10,232,490 net tons, total 117,547,470 net tons.

\*Revised. †Preliminary figures, subject to revision. ‡Index of production based on average annual production of the three years 1947-1948-1949.

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*NON-FLUID OIL is not the name of a general class of lubricants, but is a specific product of our manufacture.*

### Plates . . .

Plate Prices, Page 212

**Pittsburgh**—With large inventories and promise of quick delivery, demand holds level at a good rate from warehouses and fabricators. Sales are even with last month.

**Boston**—Plate mills have to dig to fill April schedules, although demand for lighter gages shows a slight gain. Small tanks, notably for fuel storage at airports, account for a slight increase in backlog with one or two shops.

**New York**—Inquiry from the oil and chemical industries is doing much to bolster the meager activity in plates. Oil refinery building and modernization are accounting for substantial tonnage.

**Philadelphia**—Plate demand lacks buoyancy. It is getting no worse, but it reflects little gain. Lead-time is usually 10 days to two weeks.

**Seattle**—Plate fabricators report large projects lacking. However, there is some interest being shown in small water storage tanks, running to under 100 tons each.

### Steel Bars . . .

Bar Prices, Page 212

**New York**—Hot bar sellers can still book tonnage for April rolling. However, this reflects no easier situation than a month ago and sellers report business is holding its own and, perhaps is a little better. March showed a mild uptrend in new orders and some sellers insist this will prove the case in April. Cold drawers are taking in a little more tonnage as a result of some gain in sales, and more tonnage being specified for construction and maintenance.

**Chicago**—Inland Steel Co. issued a revised list of extras on rail steel bars, shapes and bands effective Apr. 5. The revisions include some reductions in length and cutting extras and two changes in size extras for plain rounds.

**Boston**—Bar users are placing more orders for small sizes but individual lots are under the normal average. Consumers show no disposition to build inventories in view of current prompt shipments.

**Pittsburgh**—Cold-finished bar sales, in some cases, are running ahead of last year's totals in the number of incoming orders. Individual orders are for small quantities. Outlook for April is for a slight increase over March sales.

**Cleveland**—Barmakers continue to find the going rough although here and there some slight pickup in de-

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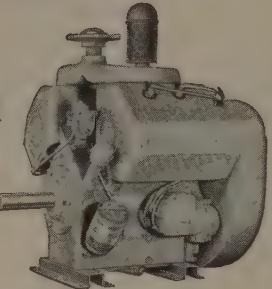
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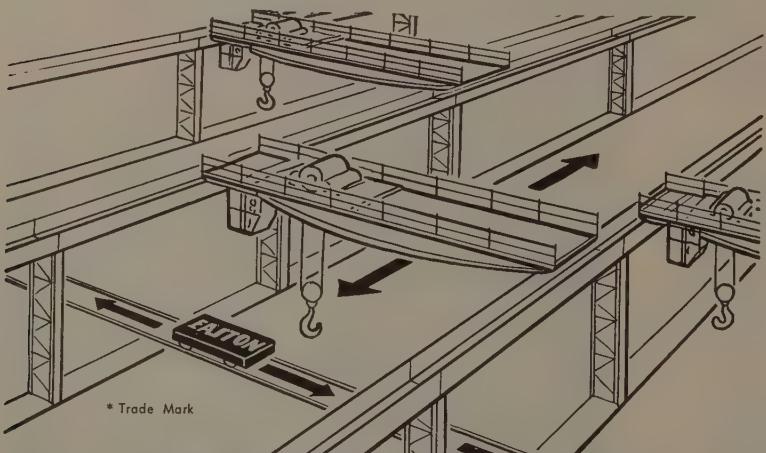
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mand is reported. In the main, however, consumers still are depending on inventories.

Philadelphia — Hot-rolled carbon bar shipments this month should show a small edge over March.

The Navy procurement office here is inquiring for 235 tons of nickel-molybdenum alloy reforging material and 105 tons of free-cutting bars, the latter for Raritan Arsenal, New Jersey; also 100 tons of cold finished screw stock.

Cincinnati—There are no supply shortages in carbon and alloy bars. Business continues much the same with a few sellers reporting a slight pickup.

## Tubular Goods . . .

Tubular Goods Prices, Page 215

Boston—On limited orders for direct shipment, notably seamless for utilities, earliest shipment frequently is the decisive factor. Mills are equalizing on seamless, but none are suffering too much with production and basing largely in Mid-west of Pittsburgh. Seamless price averages out to around \$2 over lapweld produced in smaller sizes in East.

Merchant pipe sales of distributors are up slightly, but mill tonnage held to replacement needs.

New York—As building operators expand commercial pipe inquiry improves. Resellers' prices are unsettled. Direct demand from public utilities is steady.

Philadelphia—Merchant pipe business is in a seasonal upswing, following the trend in building activity. Resellers' prices, however, have stiffened little.

Pittsburgh—Tubemakers report reduced operations. Welded tube producers report consumer inventories so low immediate delivery is required. Seamless tube sales are due.

Chicago—Sales of light and medium tubular products have improved steadily during the past month and sales currently are not too far below volume during the comparable period last year.

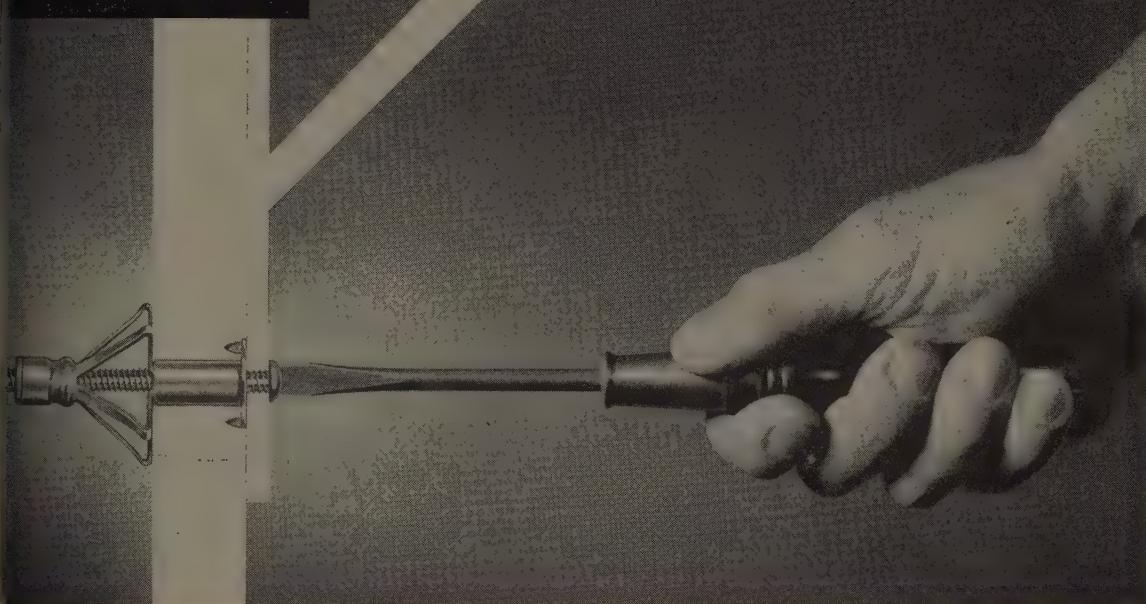
St. Louis—Pipe demand remains strong in sizes up to 4 inches. Approved order books are reported filled.

Los Angeles—Australian pipe is a market in quantity.

Pacific Tube Co. installed a 150,000 pound draw-bench, said to be the largest in the Far West, to draw tubing up to 6½ inches in diameter and 51 feet in length.

Seattle—Considerable activity in less-than-carload lots is noted as cities seek to cover cast iron pipe requirements for improvements in municipal systems and for invento

**Carpenter A. E. S.\***



## Help for Handymen at Home



*Another example of how Carpenter  
\*Application Engineering Service  
is helping industry cut costs.*

Ever try to turn a screw through plaster into a hollow wall? The result is usually disastrous...unless a device, such as this patented screw anchor, is used.

With this anchor it's an easy matter to drill a hole, insert the device, then turn it tight. And it holds securely. But you'd be surprised at the production problems involved, even with a small item like this. For example, it's a highly competitive product turned out in huge quantities. This means that the tools and dies used to make it have to be just right—they have to hold sharpness, be accurate, provide adequate toughness, and hold up in the presses with no trouble while producing millions of parts.

To help control production costs, the manufacturer called

on Carpenter Application Engineering Service for counsel in selecting die steels for the different sections of the progressive dies. A.E.S. supplied the answer—recommended five different steels in the Carpenter Matched Set...each engineered to perform its job best. Here, in the manufacturer's words, is the result: "With the help of Carpenter die steels we've been able to control our production costs so closely that there has been no price increase in the last five years!" (A detailed Field Report on the tooling for this job is available on request.)

Time and again, industry is finding new ways to hold costs in line and improve product sales with the help of Carpenter Application Engineering Service. A.E.S. is a service backed by almost 70 years of leadership in specialty steel development. It embraces trained Field Engineers, experienced representatives, competent Mill Metallurgists ready to work with you for best results. A.E.S. starts with your first call to Carpenter. THE CARPENTER STEEL COMPANY, 139 W. Bern St., Reading, Pa.

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The tremendous progress in instrumentation that has come out of Honeywell's intensive development program has made many older instruments obsolete. Modernizing your plant instruments, to take full advantage of this progress, can bring you a number of specific benefits.

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Wayne and Windrim Avenues, Philadelphia 44, Pa.



MINNEAPOLIS  
**Honeywell**  
BROWN INSTRUMENTS

*First in Controls*

## Wire . . .

Wire Prices, Page 214

**Chicago**—Merchant wire products are moving well following the usual seasonal pattern. However, jobbers display a reticence to enlarge stocks. Ability of mills to ship quickly apparently prompts jobbers to maintain inventories at barest minimum.

**Boston**—Slight increase in diversification of wire demand is accompanied by some seasonal improvement in merchant products, including highway cable and fencing.

**New York**—Sluggish recovery in wire buying is attributed to inventory and consumption. Both are lower and orders are small for prompt delivery.

**Philadelphia**—Modest gain in wire demand is reflected principally in the merchant products. Little change is noted in movement of manufacturers' items.

**Pittsburgh**—Seasonal increases continue in merchant products such as chain link fence, barbed wire and nails. Other wire sales show no improvement.

## Reinforcing Bars . . .

Reinforcing Bar Prices, Page 212

**Los Angeles**—In the face of lessened demand for reinforcing bars, local barmakers are aroused over imports of Japanese material at San Diego for re-shipment to Mexico.

## Pig Iron . . .

Pig Iron Prices, Page 216

**Buffalo**—While pig iron buying is sustained among building equipment casters, the general merchant pig iron market remains spotty. Automotive demand is fair. General foundries, however, continue to operate on curtailed basis.

**Cleveland**—Spotty foundry operations and availability of tonnage for quick shipment make for continued sluggish movement of merchant iron.

**New York**—Pig iron business is lagging. Sellers note little change in volume. Gray iron shops are operating three to four days a week. Steel and malleable casting plants are doing a little better, but as compared with their own operations a few weeks ago, are showing little pickup.

**Cincinnati**—Sales remain on the slow side. Pig iron prices remain firm. Foundries on agricultural implement work note a pickup.

**Philadelphia**—While four blast furnaces in the eastern Pennsylvania area suspended operation this past

(Please turn to page 231)

# specialties

**S.O.P.**



### STANDARD OPERATING PROCEDURE

SEE US AT THE TOOL SHOW,  
BOOTH 440, PRECISION HALL

Forty years' experience in the stamping business has taught us the value of giving our customers certain processing procedures which are ordinarily considered "extras". This policy of considering your needs first is largely responsible for our consistently rapid growth.



Close tolerance coining is one of the production methods that DeStaCo offers, not as a specialty, but as a Standard Operating Procedure. Our knuckle-action presses accommodate up to 400-ton capacity . . . frequently save you the additional expense of a grinding or machining operation.



Our precision parts department turns out critical stampings such as refrigerator intake and discharge valve reeds. These parts are made of heat-treated and ground imported DeStaCo valve steels. Our own Iso-Finish method provides a sealed-edge, strain-relieved surface for long life.



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Other DeStaCo specialties are Toggle Clamps for jigs and fixtures, Precision Washers, Arbor Spacers and Shims, Shim and Feeler Stock.

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Write us for our Stamping brochure



## CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

## MANGANESE ALLOYS

**Spiegeleisen:** (19-21% Mn, 1-3% Si). Carlot per gross ton \$86, Palmerton, Pa.; \$87 Clairton and Duquesne, Pa.

(16 to 19% Mn) \$84 per ton, Palmerton, Pa.; \$85 per ton, Clairton and Duquesne, Pa.

**Standard Ferromanganese:** (Mn 74-76%, C 7% approx.) Base price per net ton \$200, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Oreg.; add or subtract \$2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump \$208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add \$2.60 for each 1% above 81%; subtract \$2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

**Low-Carbon Ferromanganese, Regular Grade:** (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max, 0.15% C grade from above prices, 1c for max, 0.30% C 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices, Spot, add 0.25c.

**Medium-Carbon Ferromanganese:** (Mn 80-85, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

**Manganese metal, 2" x D** (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

**Electromanganese:** Min. carloads, 30c; 2000 lb to min. carloads, 32c; 250 lb to 1999 lb, 34c; less than 250 lb, 37c. Premium for hydrogen-removed metal, 1.5c per lb, f.o.b. cars, Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

**Silicomanganese:** (Mn 65-85%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.00c per lb of alloy, carload packed, 11.75c, ton lots 12.5c, less ton 13.65c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

## TITANIUM ALLOYS

**Ferrotitanium, Low-Carbon:** (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, \$1.50 per lb of contained Ti; less ton \$1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots \$1.35, less ton \$1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis, Spot, add 5c.

**Ferrotitanium, High-Carbon:** (Ti 15-18%, C 6-8%). Contract \$177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

**Ferrotitanium: Medium-Carbon:** (Ti 17-21%, C 2-4.5%). Contract \$195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

## CHROMIUM ALLOYS

**High-Carbon Ferrochrome:** Contract, C.I. lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

**Low-Carbon Ferrochrome:** (Cr 67-72%). Contract, carload, lump, bulk, max. 0.025% C (Simplex) 34.50c per lb of contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

**Foundry Ferrochrome, High-Carbon:** (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton lot 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

**Foundry Ferrochrome, Low-Carbon:** (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

**Low-Carbon Ferrochrome Silicon:** (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 10.8c per pound of contained silicon; 1" x down, bulk 25.25c per pound of contained chromium plus 11c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

**Chromium Metal:** (Min 97% Cr and 1% Fe) contract, 1" x D; packed, max 0.50%, \$1.12, ton lots \$1.14; less ton \$1.16. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

## VANADIUM ALLOYS

**Ferrovanadium:** Open-hearth Grade (V 35-55%, Si 12-18% max, C 3-3.5% max). Contract, any quantity, \$3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max, \$3.10. **Primes and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) \$3.20.

**Granal:** Vanadium Granular No. 1, \$1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

**Vanadium Oxide:** Contract, less carload lots \$1.28 per lb contained  $V_2O_5$ , freight allowed. Spot, add 5c.

## SILICON ALLOYS

**25-30% Ferrosilicon:** Contract, carload, lump, bulk, 20.00c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

**50% Ferrosilicon:** Contract, carload, lump, bulk, 10.80c per lb of contained Si, carload packed 12.40c, ton lot 13.85c, less ton 15.5c. Delivered. Spot, add 0.45c.

**Low-Aluminum 50% Ferrosilicon:** (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

**65% Ferrosilicon:** Contract, carload, lump, bulk, 12.2c per pound contained silicon; carload packed 13.55c; ton lots, 14.75c; less ton, 16.1c, delivered. Spot, add 0.35c.

**75% Ferrosilicon:** Contract, carload, lump, bulk, 13.8c per lb of contained Si, carload packed 15.1c, ton lot 16.25c, less ton 17.5c. Delivered. Spot, add 0.8c.

**90-95% Ferrosilicon:** Contract, carload, lump, bulk, 17.00c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

**Silicon Metal:** (Mn 97% Si and 1% max Fe). C.I. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

**Alisifer:** (Approx. 20% Al, 40% Si, 40% Fe) Contract, same f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, smaller lots 11c.

## ZIRCONIUM ALLOYS

**12-15% Zirconium Alloy:** (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk, 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

**35-40% Zirconium Alloy:** (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

## BORON ALLOYS

**Ferroboron:** (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, \$1.20 per lb of alloy. Less than 100 lb \$1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (14-14% B) 85c per pound; Grade B (14-18% B) \$1.20; Grade C (19% min B) \$1.50.

**Borosil:** (3 to 4% B, 40 to 45% Si), \$5.25 per lb contained B, delivered to destination.

**Bortam:** (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

**Carbortam:** (B 1 to 2%). Contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

## CALCIUM ALLOYS

**Calcium-Manganese-Silicon:** (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

**Calcium-Silicon:** (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.26c.

## BRIQUETTED ALLOYS

**Chromium Briquets:** (Weighing approx. 3% lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.95c. Deld. Add 0.25c for notching. Spot, add 0.25c.

**Ferromanganese Briquets:** (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

**Silicomanganese Briquets:** (Weighing approx. 3 1/2 lb and containing exactly 2 lb of Mn and approx. 1/2 lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

**Silicon Briquets:** (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.8c per lb of briquet. Packed c.l. 7.10c, ton lot 7.9c, less ton 8.8c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2 1/2 lb and containing exactly 1 lb of Si). Carload, bulk 6.45c. Packed c.l. 7.25c, ton lot 8.05c, less ton 8.95c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

**Molybdc-Oxide Briquets:** (Containing 2 1/2 lb of Mo each) \$1.14 per pound of Mo contained, f.o.b. Langloeth, Pa.

## TUNGSTEN ALLOYS

**Ferrotungsten:** (70-80%), 5000 lb W or more, \$3.80 per lb of contained W; 2000 lb W to 5000 lb W, \$3.90; less than 2000 lb W, \$4.02, f.o.b. Niagara Falls, N. Y.

## OTHER FERROALLOYS

**Ferrocolumbium:** (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, \$9.55 per lb of contained Cb, less ton \$9.55. Delivered. Spot, add 10c.

**Ferrotantalum—Columbium:** (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, \$4.75 per lb of contained Cb plus Ta, del'd; less ton lots \$4.80.

**Silicaz Alloy:** (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

**SMZ Alloy:** (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, 1/2" x D, 12 M, 17.5c per lb of alloy, ton lots 20.25c, less ton 19.5c. Deld. Spot, add 0.25c.

**Graphidox No. 4:** (Si 48-52%, Ca 5-7%, Ti 9-11%). C.I. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

**V-5 Foundry Alloy:** (Cr 38-42%, Si 17-19%, Mn 8-11%). C.I. packed, 16.6c per lb of alloy; ton lots 18.10c; less ton lots 19.35c, f.o.b. Niagara Falls; freight allowed to St. Louis.

**Simanal:** (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 14.50c. Packed 15.50c, ton lots, 15.75c, less ton lots, 16.25c per lb of alloy, delivered.

**Ferrophosphorus:** (23-25% based on 24% P content with unitage of \$4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., \$9.00 per gross ton.

**Ferromolybdenum:** (55-75%). Per lb contained Mo, f.o.b. Langloeth, \$1.32 in all sizes except powdered which is \$1.41; Washington, Pa., furnace, any quantity \$1.32.

**Technical Molybdc-Oxide:** Per lb, contained Mo, f.o.b. Langloeth, Pa., \$1.14 in cans; in bags, \$1.13, f.o.b. Langloeth, Pa.; Washington, Pa., \$1.13.

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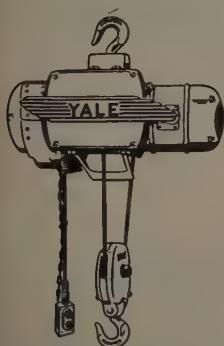


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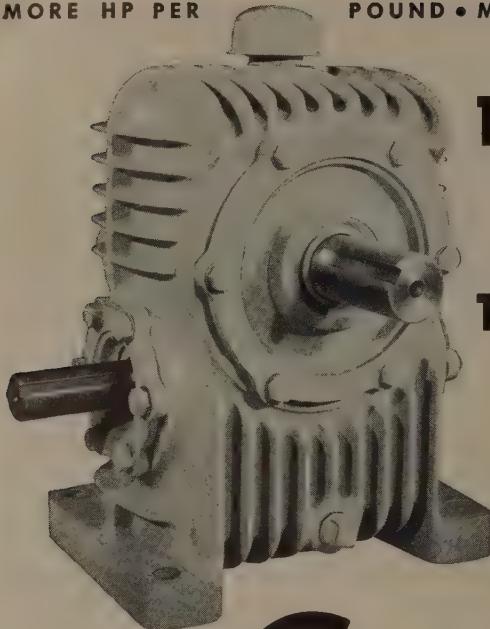
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## ORES-COKE-REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

## ORES

## Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer ..... \$10.30

Old range nonbessemer ..... 10.15

Mesabi bessemer ..... 10.05

Mesabi nonbessemer ..... 9.90

Open-hearth lump ..... 11.15

High phosphorus ..... 9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

## Eastern Local Iron Ore

Cents per unit del'd. E. Pa., Foundry and basic 56-62% concentrates contract ..... 17.00-18.00

## Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports Swedish basic, 60 to 68% ..... 20.00

North African hematite (spot) ..... 20.00-22.00

Brazilian iron ore, 68-69% (spot) ..... 25.00

## Tungsten Ore

Net ton unit, before duty Foreign Wolframite, good commercial quality ..... 17.00-17.50

Domestic scheelite, mine ..... 63.00

## Manganese Ore

Mn 48%, nearby, \$1.02-\$1.05 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, \$0.95-\$0.97.

## Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Ore., or Tacoma, Wash.:

48% 2.8:1 ..... \$40.00-\$42.00

48% 3:1 ..... 44.00-46.00

48% no ratio ..... 32.00-34.00

## South African Transvaal

48% no ratio ..... \$24.00-\$26.00

48% no ratio ..... 34.00

## Domestic

(Rail nearest seller) 48% 3:1 ..... \$39.00

## Molybdenum

Sulphide concentrate, per lb, Mo content mines, unpacked ..... \$1.00

## Antimony Ore

Per unit of Sb content, c.i.f. seaboard 50-60% ..... \$2.40-\$2.80

65% min. ..... \$3.40-\$3.50

## Vanadium Ore

Cents per lb. V<sub>2</sub>O<sub>5</sub> content, del'd. mills

Domestic ..... 31.00

## REFRACTORIES

## Fire Clay Brick

High-Heat Duty: Pueblo, Colo., \$89; Ashland, Grawn, Hayward, Hitchins, Haldeman, Olive

Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orivston, West, Decatur, Pa., Bessemer, Ala., Farber, Marion, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ironton, Ill., Stevens Pottery, Ga., Woodbridge, N. J., \$109; Salina, Pa., \$114; Niles, O., \$120; Los Angeles, Pittsburgh, Calif., \$132.30.

## Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Emsley, Ala., Portsmouth, O., \$115; Warren, O., Hays, Pa., \$120; Niles, O., \$120; E. Chicago, Ind., Joliet, Rockdale, Ill., \$125; Cutler, Utah, \$116.55; Los Angeles, \$122.85.

## Insulating Fire Brick

2300° F: Massillon, O., \$178.50; Clearfield, Pa., \$213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., \$206; Vandalia, Mo., \$214.10; Portsmouth, O., \$207.50; Bessemer, Ala., \$212.80.

## Ladie Brick

Dry Pressed: Bessemer, Ala., \$64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsburg, O., \$77.50; Mexico, Mo., \$73.50; Clearfield, Pa., Portsmouth, O., \$83; Perla, Ark., \$109; Los Angeles, \$110.25; Pittsburgh, Calif., \$111.30.

## Sleeves

Reeddale, Pa., \$139.70; Johnstown, Pa., \$140; Clearfield, Pa., \$148.50; St. Louis, \$151.80; Athens, Tex., \$165.

## Nozzles

Reeddale, Pa., \$223.50; Johnstown, Pa., \$229.20; Clearfield, Pa., \$241.40; St. Louis, \$247.10; Athens, Tex., \$247.70.

**Runners**  
Reeddale, Pa., \$174; Johnstown, Pa., \$177.80; Clearfield, Pa., \$185.50; St. Louis, \$187.30; Athens, Tex., \$191.80.

**High-Alumina Brick**  
50 Per Cent: Clearfield, Pa., St. Louis, Mexico, Mo., \$179; Danville, Ill., \$169.30. 60 Per Cent: St. Louis, Mexico, Vandalia, Mo., \$223.00; Danville, Ill., \$213.20. 70 Per Cent: St. Louis, Mexico, Vandalia, Mo., \$225; Danville, Ill., \$228; Clearfield, Pa., \$262.

**Dolomite**  
Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., \$14.50; Thornton, McCook, Ill., \$14.60; Dolly Siding, Bonne Terre, Mo., \$13.65.

**Magnesite**  
Domestic, deadburned bulk: Luning, Nev., \$38.

## METALLURGICAL COKE

Price per net ton  
**Beechwood Ovens**  
Connellsville, furnace ..... \$14.50-\$15.00  
Connellsville, foundry ..... 16.50-17.00

**Oven Foundry Coke**  
Kearney, N. J., ovens ..... \$24.00  
Everett, Mass., ovens  
New England, del'd. ..... 24.50  
Chicago, ovens ..... 24.00  
Chicago, del'd. ..... 24.25  
Cincinnati, ovens ..... 25.85  
Palmsville, O., ovens ..... 25.50  
Cleveland, del'd. ..... 27.43  
Erie, Pa., ovens ..... 25.00  
Birmingham, ovens ..... 22.65  
Cincinnati, del'd. ..... 27.58  
Lone Star, Tex., ovens ..... 18.50  
Philadelphia, ovens ..... 23.95  
Swedeland, Pa., ovens ..... 23.00  
St. Louis, ovens ..... 28.00  
St. Louis, del'd. ..... 27.75  
St. Paul, ovens ..... 24.00  
Portsmouth, O., ovens ..... 26.82  
Cincinnati, del'd. ..... 25.50  
Detroit, ovens ..... 28.50  
Buffalo, del'd. ..... 28.08  
Flint, del'd. ..... 28.23  
Pontiac, del'd. ..... 27.06  
Saginaw, del'd. ..... 28.58

\*Or within \$4.55 freight zone from works.

## COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol ..... 40.00  
Toluol, one deg. ..... 32.00-35.00

Industrial xylol ..... 32.00-35.00

Per ton, bulk, ovens ..... \$44-\$47

Birmingham area ..... 45.00

†With port equalization against imports.

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars ..... 18.00

c.l. drums ..... 19.00

l.c.l. drums ..... 19.50

## FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF<sub>2</sub> content 72.5%, \$44; 70%, \$42.50; 60%, \$38. Imported, net ton, duty paid, metallurgical grade, \$35-\$36.

## ELECTRODES

(Threaded with nipple, unboxed f.o.b. plant)

GRAPHITE	INCHES	Length	Per
Diam.			100 lb
2		24	\$43.50
2 1/2		30	28.00
3		40	27.25
4		40	26.00
5 1/2		40	25.75
6		60	23.25
7, 8, 9, 10		60	21.00
12, 14		72	20.50
16		72	20.00
17		60	20.50
18		72	20.50
20		72	20.00

CARBON	72, 84	Per
40	100	\$8.85
40, 35, 30	110	8.95
	84	9.10
	96	8.90
24		9.10
20	90	8.95
20	84	9.10
20	72	9.10
17	60	9.50
17	72	9.50
14, 12, 10	60	10.30
8	60	10.55

Welded steel points the way for the product engineers who

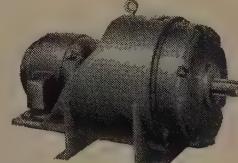
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## Proper Design in Welded Steel is Always Lower in Cost

**Material Cost is Less**—It's a fact . . . steel is three times stronger than iron, two and a half times as rigid. Where strength alone is needed, one-third the metal is necessary. When rigidity is important, less than half the material is required. But steel costs only one-third as much per pound. Steel is more easily placed where it can carry more load per pound of metal. As a result, ultimate savings with steel are limited only by the resourcefulness of the designer.

**Manufacture is Simpler**—Fewer man-hours . . . simpler, less costly production tools are needed to manufacture products from steel. By proper design, many operations needed for machining castings can be eliminated entirely. Assembly operations can be simplified . . . finishing and cleaning manhours reduced substantially.

Products designed in steel have a modern appearance to improve selling appeal while reducing costs on an average of 50% according to field reports.



**Welded Design Saves 50% on motor gear housing.** Original cast construction weighed 175% more . . . required 90% more machining.



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Your Lincoln Representative is a specialist in welded design. We will gladly assist your engineers in restudying designs to determine where and how welded steel can save an average of 50% in the manufacture of your products. Call or write.

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*a new flexible grinding wheel*  
especially designed for finishing contours

## GRIND-O-FLEX

is the only abrasive wheel

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- ★ Gets in and around hard-to-reach areas.
- ★ Will not "flat" or dig into surfaces.
- ★ Hits selected areas to remove as much or as little stock as needed.
- ★ Finishes metals, plastics, stainless steel.
- ★ Requires no special equipment—attaches to your power tools.
- ★ Offers a wide range of grits for all types of finishing work.



GRIND-O-FLEX removes excess metal, smooths and polishes rough surfaces. It consists of hundreds of "leaves" of abrasive cloth sealed to a core. As the wheel spins it presents a continuous abrasive surface to the work piece. The leaves wear down evenly at a uniform rate, presenting a fresh abrasive contact at all times.

GRIND-O-FLEX is flexible and gets around intricate shapes and into recesses with ease. It can be used on selected, limited areas without "flattening," gouging or marring surfaces. No skill or previous experience is necessary. Absolutely safe. GRIND-O-FLEX attaches to any rotating spindle (motor shaft, lathe, drill press, portable drill, flexible shaft, etc.)—no special equipment to buy. Wheel is 1" wide by 6 1/2" diameter and comes in a wide range of grits. Arbors and flanges are furnished for mounting wheels to any shaft. Two or more wheels may be placed side by side on the same arbor to increase grinding surface if needed (see above). For more information and prices, see your abrasive dealer or write



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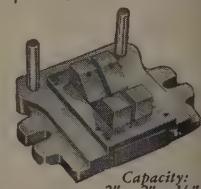
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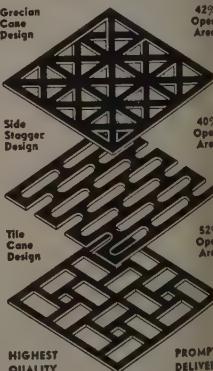
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HIGHEST  
QUALITY  
PROMPT  
DELIVERY

(Concluded from page 225)

week, one stack at Swedeland, Pa., and three at Steelton, Pa., producers have enough iron on hand to meet customers' requirements for the period of furnace suspension.

**Chicago**—Spotty conditions prevail in foundries but prospect is that pig iron purchases in April will at least equal, perhaps exceed, those in March.

## Rails, Cars . . .

Track Material Prices, Page 215

**New York**—Freight car order backlog amounted to 20,966 cars at beginning of this month, compared with 25,441 on Mar. 1. Domestic car orders last month totaled 348, with 251 going to commercial shops and 97 to railroad shops. Major order involved 235 tank cars.

March deliveries numbered 4823 cars, against 3974 in February, and 6679 in March, 1953.

## Metallurgical Coke . . .

Metallurgical Coke Prices, Page 229

**Cleveland**—Spotty foundry operations are reflected in continued sluggish movement of oven coke. Day-to-day requirements vary from shop to shop and supplies are adequate to meet demands promptly.

**Philadelphia**—The Swedeland, Pa. producer has reduced its price on oven foundry coke 85 cents per ton to \$23 ovens.

**Chicago**—Sales of foundry coke in April likely will top March business by a narrow margin but the situation still is touch and go.

## Structural Shapes . . .

Structural Shape Prices, Page 212

**Philadelphia**—Structural inquiry is expanding moderately, especially for bridgework and schools. A number of schools are now either active or in the late planning stages. These projects average about 100 tons each.

**Boston**—Structural shops are holding plain material orders to fill-in tonnage on which they want prompt shipment. Fabricated steel prices are subject to sharp competition, although, in most cases, shops hold about three months backlog.

**New York**—Bridge work is expanding and promises to play a leading role in construction activity. There is an increasing diversity of building construction, including school work on Long Island and in northern New Jersey. Competition among fabricators is keen.

**Pittsburgh**—Construction com-



**KRAINE KAR**

**SAVED US \$3824.24  
IN 8 MONTHS!"**

Says V. James DeNaples,  
TECHNICAL SERVICES FOREMAN,  
NORMA-HOFFMANN  
BEARINGS CORP.

**"THIS VERSATILE YARD CRANE** simplifies our materials-handling," says Mr. DeNaples, "cuts operations and travel trips, saves us a considerable amount of work and time. Our **KRAINE KAR** speeds unloading of incoming materials . . . transports and stacks them at storage . . . loads them on floor trucks for delivery inside (long shafts of tubing, stacked bearing ring forgings, 800 and 1000 lb. coils of steel strip). Also loads outgoing scrap and waste drums on trucks and gondolas; tows sludge wagon from grinding waste chute to waste dump, up-ends it, tows it back." Monthly net savings—\$478.03! Ask for Bulletin No. 89.

Gas or diesel, 9 to 37 ft. booms or adjustable telescopic booms; pneumatic or solid rubber tires; electric magnet, clamshell bucket and other accessories.

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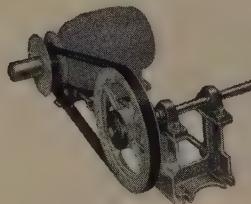
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Quickly installed on new or old equipment. Change speed while machine is running. Ratios to 3 to 1. Fractional to 10 hp.

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ries can obtain full requirements shapes. Delivery of some light items is slow.

## Tool Steel . . .

Tool Steel Prices, Page 216

New York—Shipments of high speed and tool steel (excluding hollow drill steel) totaled 7431 net tons in February, reports the American Iron & Steel Institute. This was a decline compared with shipments of 17 tons in January, and was off sharply from the 10,046 tons shipped February a year ago.

In the first two months this year shipments amounted to 15,548 net tons, comparing with 19,815 tons in the like period of 1953, 28,016 tons in the corresponding period of 1952 and 26,127 tons in the first two months of 1951.

February shipments consisted of 63 tons of Class A high speed steel against 1272 tons the preceding month; 232 tons of Class B high speed steel against 269 in January; and 6103 tons other tool steels against 6683 in the preceding month.

Pittsburgh—Inventory adjustment which has depressed sales this year may be nearly completed, producers say.

## STRUCTURAL SHAPES . . .

### STRUCTURAL STEEL PLACED

100 tons, apartment, lower Fifth Ave., on site of old Brevort Hotel, New York, for Minskoff & Son, to Bethlehem Steel Co., Bethlehem, Pa.

10 tons, state highway bridge, Charlemont, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Daniel O'Connell's Sons Co., Holyoke, Mass., general contractor.

15 tons, 4-span slab bridge on I-beams, Nashua, N. H., to Phoenix Bridge Co., Phoenixville, Pa.; E. D. Swett, Winchester, N. H., general contractor; also 100 tons of reinforcing and bearing piles to be placed.

10 tons, stringer bridges, Brockton section, Fall River, Mass., expressway, to Phoenix Bridge Co., Phoenixville, Pa.; D. V. Frione & Son, New Haven, Conn., general contractor.

10 tons, building, Insurance Co. of North America, Philadelphia, to Frank M. Weaver Co., that city.

10 tons, frame and welded plate girder bridge, Pennichuck Brook, Nashua-Merrimack, N. H., to Phoenix Bridge Co., Phoenixville, Pa.; R. G. Watkins & Son Inc., Amesbury, Mass., general contractor; also 65 tons, steel bearing piles to be placed.

10 tons, parish school, Seattle area, and miscellaneous, to Pacific Car & Foundry Co., Seattle.

10 tons, bridge, Alaska Road Commission, to Isaacson Iron Works, Seattle.

### STRUCTURAL STEEL PENDING

900 tons, bridge work, state thruway, Monroe county, New York, Lane Construction Corp., Meriden, Conn., low on general contract.

800 tons, cantilever hangar, airfield base, Portsmouth, N. H., Arthur Venneri Co., Westfield, N. J., low.

600 tons, A & P store, Yeadon, Pa., John A. Robbins, general contractor, Philadelphia.

60 tons, barracks and structures, airfield base, Portsmouth, N. H.; bids Apr. 23.

65 tons, bridges and subway, Cook and Clark counties, Illinois, State Division of Highways, Springfield, Ill., Bethlehem Steel Co., Bethlehem, Pa., low.

# "Standard" Serves Manufacturers Who Use All Shapes and Sizes of MECHANICAL STEEL TUBING

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TUBE DIAMETER "O.D. SIZE	MAXIMUM WALL		MINIMUM WALL	
	DECIMAL	B. W. GAUGE	DECIMAL	B. W. GAUGE
1/2"	.065"	16	.028"	22
5/8"	.065"	16	.028"	22
3/4"	.065"	16	.028"	22
7/8"	.083"	14	.028"	22
1"	.109"	12	.028"	22
1-1/8"	.134"	10	.028"	22
1-1/2"	.148"	10	.035"	22
1-5/8"	.148"	9	.035"	20
1-3/4"	.148"	9	.035"	20
1-7/8"	.165"	9	.035"	20
2"	.165"	8	.035"	20
2-1/4"	.180"	8	.035"	20
2-1/2"	.203"	7	.035"	20
2-3/4"	.203"	6	.035"	20
3"	.220"	6	.049"	20
3-1/4"	.220"	5	.049"	18
3-1/2"	.238"	5	.049"	18
3-3/4"	.238"	4	.049"	18
3-7/8"	.238"	4	.049"	18
4"	.238"	4	.049"	18
4-1/4"	.250"	4	.049"	18
4-1/2"	.250"	3	.065"	18
4-3/4"	.250"	3	.083"	16
5"	.180"	3	.083"	14
5-1/2"	.180"	7	.083"	14
		7	.083"	14

\*Intermediate sizes within the range indicated can also be manufactured. Please consult us for sizes not listed.



Manufacturers requiring tubing for civilian or defense production prefer "Standard's" Electric Weld Steel Tubing for many reasons! "Standard's" Electric Weld is produced in one of the most versatile and complete mills of its kind in the world. "Standard's" 13 years of specialized tubing "know-

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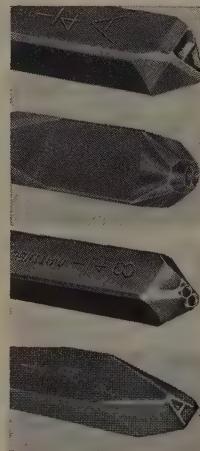
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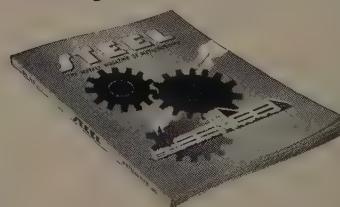
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ALL 4 buying influences . . .

management, production, engineering, purchasing.

0 tons, secondary school, Clearfield, Pa., bids Apr. 29.  
 0 tons, three buildings, Dow Airfield Base, Bangor, Me.  
 0 tons, grade separations and bridge, Kankakee and McHenry counties, Illinois, State Division of Highways, Springfield, Ill., Vincennes Steel Corp., Vincennes, Ill., low.  
 0 tons, state bridge work, Bucks county, Pennsylvania, bids Apr. 23.  
 0 tons, addition, Coughlin high school, Wilkes-Barre, Pa., bids asked.  
 0 tons, Supply Department, Puget Sound shipyard, Bremerton, Wash.; bids Apr. 21.  
 0 tons, bridge, Jackson county, Illinois, State Division of Highways, Springfield, Ill., American Bridge Division, U. S. Steel Corp., Pittsburgh, low.  
 0 tons, trash racks, Palisades dam, Idaho; Herrick Iron Works, Oakland, Calif., low.  
 \$5,100 to Bureau of Reclamation, Denver.  
 0 tons, state bridge work, Susquehanna county, Pennsylvania, bids May 7.  
 0 tons, state bridge work, Tioga county, Pennsylvania, bids Apr. 30.  
 0 tons, gate hoists, Palisades dam, Idaho; C. C. Steward Machine Co., Birmingham, low \$22,517, to Bureau of Reclamation, Denver.

### EINFORCING BARS . . .

#### REINFORCING BARS PLACED

0 tons, Ladd Air Base dormitories, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; Grove, Shepherd, Wilson & Kruege, Seattle, general contractors, \$4,196,083.  
 0 tons, grain elevator, Wilson Creek, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle.

#### REINFORCING BARS PENDING

0 tons, also 113 tons shapes and unstated piling, Idaho State Sand Point bridge; Peter Kiewit Sons Co. and LeBeouf, Dougherty Co., Longview, Wash., joint low, \$1,135,332.  
 0 tons, transmission tower foundations, Big Bend-Granite Falls line, South Dakota-Minnesota; bids Apr. 22, Bureau of Reclamation, Denver; contract also includes erection of 11,000 tons of steel towers.  
 5 tons, bridge piers and abutments, Maine turnpike extension, between Falmouth and Gray, Me.; bids in, Augusta, Me.; contract also for erection of 715 tons, structural steel for 9 bridges.  
 0 tons, also miscellaneous steel, 70 miles laterals, Columbia Basin project; bids to Bureau of Reclamation, Denver, within 30 days.  
 5 tons, 274-ft concrete bridge, Boise county, Idaho; bids to Bureau of Public Roads, Boise, Apr. 22.

### LATES . . .

#### PLATES PLACED

0 tons, three elevated water storage tanks, Benton Township, Mich., to Pittsburgh-Des Moines Steel Co., Pittsburgh, \$189,700.

#### PLATES PENDING

5 tons, hull plates, Navy, general stores office, Philadelphia, bids Apr. 21.

### PIPE . . .

#### CAST IRON PIPE PLACED

30 tons, 8 and 6-inch, to Pacific States Cast Iron Pipe Co., Provo, Utah, by Corvallis, Oreg.

#### CAST IRON PIPE PENDING

30 tons, 15,000 feet standard 6-inch, for stockpile; bids to John L. Sugars, clerk, Everett, Wash., Apr. 12.  
 31 tons, bids to Omak, Wash., Apr. 16.

### RAILS, CARS . . .

#### RAILROAD CARS PLACED

0 tons, Texas & Pacific, 200 fifty-ton steel box cars, and 15 steel caboose cars, to the road's Marshall, Tex., shops for delivery in 1955.

#### RAILROAD CARS PENDING

Army Transportation Corps, Marietta, Pa., 825 steel box cars, 565 gondolas, and 50 hopper cars, bids Apr. 19.  
 American Railway Express, 500 express refrigerator cars, bids asked.



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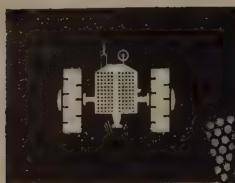
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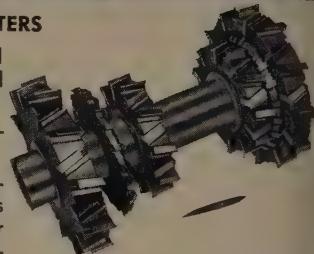
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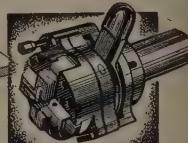
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# Dealer Scrap Stronger Though Sales Lag

Market sentiment definitely improved at some consuming centers despite curtailed steelmaking operations and absence of active buying. Lower prices resisted

## Scrap Prices, Page 238

**Chicago**—Stronger tone is noted scrap despite the fact steelmaking operations are only 74.5 per cent capacity, mill inventories are generous and, except for No. 2 heavy melting steel, supply exceeds demand. A few consumer purchases are up \$1 to \$2 a ton. Much of the carry, however, is in dealer-broker transactions with reported prices \$2 above what consumers are understood to have paid for limited tonnages. There is new strength in most cast grades.

**New York**—Trading in steel scrap is quiet, with brokers' buying prices nominally unchanged. Domestic steel scrap consumers are doing only token buying.

There is some foreign consumer interest but little tonnage is being purchased at present. Inquiry is out from Yugoslavia and Argentina. Japan is dickering, but is being handicapped by a shortage of dollars. Last fall Japan came into the United States market for 150,000 tons and up to now has covered on approximately 125,000 tons, it is estimated. Within the past few weeks three cargoes left the eastern seaboard for Japan, possibly with a total of 22,000 tons.

Despite dullness, the trade feeling here is better with the general belief prevailing the market is at bottom.

**Boston**—Steel scrap volume has dropped 75 per cent from early second quarter last year and, while the decline in prices has been stemmed, recovery is hampered by continued lack of buying. Turnings are a trifle firmer in the short shoveling classification. Cast scrap trading is in small lots, mostly by truck at unchanged prices. Best dealers will pay for unprepared steel scrap is \$7 to \$8 per ton, and they are reluctant to pay that with inventories of prepared scrap high.

**Cleveland**—Sentiment continues to improve in the scrap market although quantity sales of dealer material are absent. Some buying of production scrap by a Valley mill is reported, and rumors circulating last week were to the effect a large mill was about to place substantial orders which would include dealer grades. As a result of the improved sentiment prices on steel grades are

quoted up \$1 per ton by some sellers who report brokers meeting difficulty obtaining tonnage at lower levels.

**Pittsburgh**—Lower steel operating rates cause continued dullness in the scrap market. Stainless scrap prices are weaker. Only two mills are reported purchasers this month. Scrap dealers resist a further drop in prices.

**Buffalo**—Dealers are reluctant to accept additional orders at the current level of prices. The entire market shows steadier tendencies. Sustained buying by Canadian sources continues to absorb available cast supplies. Dealers, however, are restraining optimism because of the lagging ingot rate.

**Philadelphia**—The steel scrap market continues at a stalemate. There is, however, a slightly more optimistic tone, apparently based on more active trading in other districts. Locally, cast scrap grades and certain railroad specialties are in best demand.

**Cincinnati**—Open hearth and cast scrap moved up strongly in the local market. Steel mill purchases pushed open hearth grades up \$1 a ton. Price changes on cast ranged from \$1 to \$2 a ton. Out-of-town transactions lifted mixed borings and turnings and cast iron borings 50 cents to \$1 a ton. No. 1 railroad heavy melting climbed \$2 a ton.

**Detroit**—Scrap is holding the slight increases registered a week ago with a pickup in No. 2 grades current. Substantial portions of sales volume are going to other districts like Chicago and Pittsburgh. Mill purchases here are sluggish.

**St. Louis**—Scrap prices have firmed moderately. Dealers are not pushing offers with the mills holding supplies sufficient for 60 to 75 days at the current rate of operations. Railroad scrap offerings are substantial, except for rerollers which are in noticeably short supply. Cast scrap demand is spotty.

**Los Angeles**—Mill buying of steelworks scrap is increasing but is limited to No. 1 bundles at prices off \$2 to \$14. Foundries have sufficient supplies of cast for 3 months' production.

**San Francisco**—Steel scrap collections are discouraged by the prevailing prices. Little tonnage is being accumulated. Mill inventories are de-

(Please turn to page 240)

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## IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

## STEELMAKING SCRAP COMPOSITE

April 15	\$25.33
Apr. 8	25.33
Mar. Avg.	24.37
Apr. 1953	42.88
Apr. 1949	24.06

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

## YOUNGSTOWN

(Delivered consumer plant)	
No. 1 heavy melting...	25.00-26.00
No. 2 heavy melting...	20.00-21.00
No. 1 bundles	25.00-26.00
No. 2 bundles	18.00-19.00
Machine shop turnings	11.00-12.00
Short shovel turnings	17.00-18.00
Cast iron borings	17.00-18.00
Low phos.	26.00-27.00
Electric furnace bundles	25.00-26.00

## Railroad Scrap

No. 1 R.R. heavy melt.	27.00-28.00
------------------------	-------------

## PHILADELPHIA

(Delivered consumer plant)	
No. 1 heavy melting...	22.00
No. 2 heavy melting...	20.00
No. 1 bundles	22.00
No. 2 bundles	18.00
No. 1 busheling	22.00*
Electric furnace bundles	23.00-23.50
Machine shop turnings	11.00
Mixed borings, turnings	12.00
Short shovel turnings	16.00*
Structural & plate	26.00-27.00
Heavy turnings	20.00
Mixed borings, turnings	14.00-15.00
Short shovel turnings	17.00-18.00
Cast iron borings	17.00-18.00
Couplers, springs, wheels	30.00
Rail crops, 2 ft & under	41.00

## Cast Iron Grades

No. 1 cupola	35.00
Malleable	39.00
Heavy breakable cast.	36.50-37.50
Unstripped motor blocks	28.00*

Electric furnace bundles	28.00-29.00
--------------------------	-------------

## Cast Iron Grades

No. 1 cupola	36.00-37.00
Charging box cast	33.00-34.00
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	24.00-25.00
No. 1 machinery cast	42.00-43.00

## Railroad Scrap

No. 1 R.R. heavy melt.	28.00-29.00
Rails, 2-ft. and under	44.00-45.00
Rails, 18-in. and under	45.00-46.00
Rails, random lengths	38.00-39.00
Railroad specialties	33.00-34.00

## Stainless Steel Scrap

(F.o.b. shipping point)	
-------------------------	--

18-8 bundles & solids...	165.00-170.00
18-8 turnings	85.00-90.00
430 bundles & solids...	65.00-70.00
430 turnings	50.00-52.00

## Cast Iron Grades

Cast Iron Grades	
------------------	--

No. 1 cupola	29.00-30.00
Unstripped motor blocks	21.00-22.00*

## Stainless Steel

18-8 sheets, clips,	
solids	160.00-165.00
18-8 borings, turnings...	70.00-75.00
430 sheets, clips, solids	40.00
410 sheets, clips, solids	30.00

*Nominal.	
-----------	--

## BOSTON

(Brokers' buying prices; f.o.b.	
shipping point)	

No. 1 heavy melting...	13.25-15.00
No. 2 heavy melting...	9.25-11.25
No. 1 bundles	13.25-14.25
No. 2 bundles	7.25-9.25
No. 1 busheling	5.00-5.50

Mixed borings, turnings	5.00-5.50
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Machine shop turnings	3.00-3.50
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Short shovel turnings...	7.25-7.50
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No. 1 cast	29.00-30.00
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Mixed cupola cast...	27.00-28.00
----------------------	-------------

No. 1 machinery cast	36.00-37.00
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## CINCINNATI

(Brokers' buying prices; f.o.b.	
shipping point)	

No. 1 heavy melting...	23.00-24.00
------------------------	-------------

No. 2 heavy melting...	19.50-20.50
------------------------	-------------

No. 1 bundles	23.00-24.00
---------------	-------------

No. 2 bundles	17.50-18.50
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No. 1 busheling	20.50-21.50
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Machine shop turnings	14.00-15.00
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Mixed borings, turnings	16.50-17.00
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Short shovel turnings...	17.50-18.00
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Cast iron borings	16.50-17.00
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Low phos., 18-in. ....	30.00-31.00
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## CAST IRON GRADES

No. 1 cupola	36.00
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Heavy breakable cast...	31.00
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Charging box cast	31.00
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Drop broken machinery	42.00
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## Railroad Scrap

No. 1 R.R. heavy melt.	23.00-24.00
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Rails, 18-in. and under	39.00-40.00
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Rails, random lengths	32.00-33.00
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Railroad specialties	32.00-33.00
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Uncut tires	34.00-35.00
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Angles, splice bars	38.00-39.00
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Rails, rerolling	38.00-39.00
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## Stainless Steel

(F.o.b. shipping point)	
-------------------------	--

18-8 bundles, solids...	nom. 160.00-170.00
-------------------------	--------------------

18-8 turnings ....	nom. 70.00-80.00
--------------------	------------------

430 clips, bundles, solids	nom. 70.00
----------------------------	------------

430 turnings ....	40.00-50.00
-------------------	-------------

## Cast Iron Grades

No. 1 R.R. heavy melt.	23.00-24.00
------------------------	-------------

Rails, 18-in. and under	39.00-40.00
-------------------------	-------------

Rails, random lengths	32.00-33.00
-----------------------	-------------

Angles, splice bars	35.00-36.00
---------------------	-------------

Rails, random lengths	34.00-35.00
-----------------------	-------------

## Cast Iron Grades

No. 1 cupola	37.00
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Charging box cast	37.00
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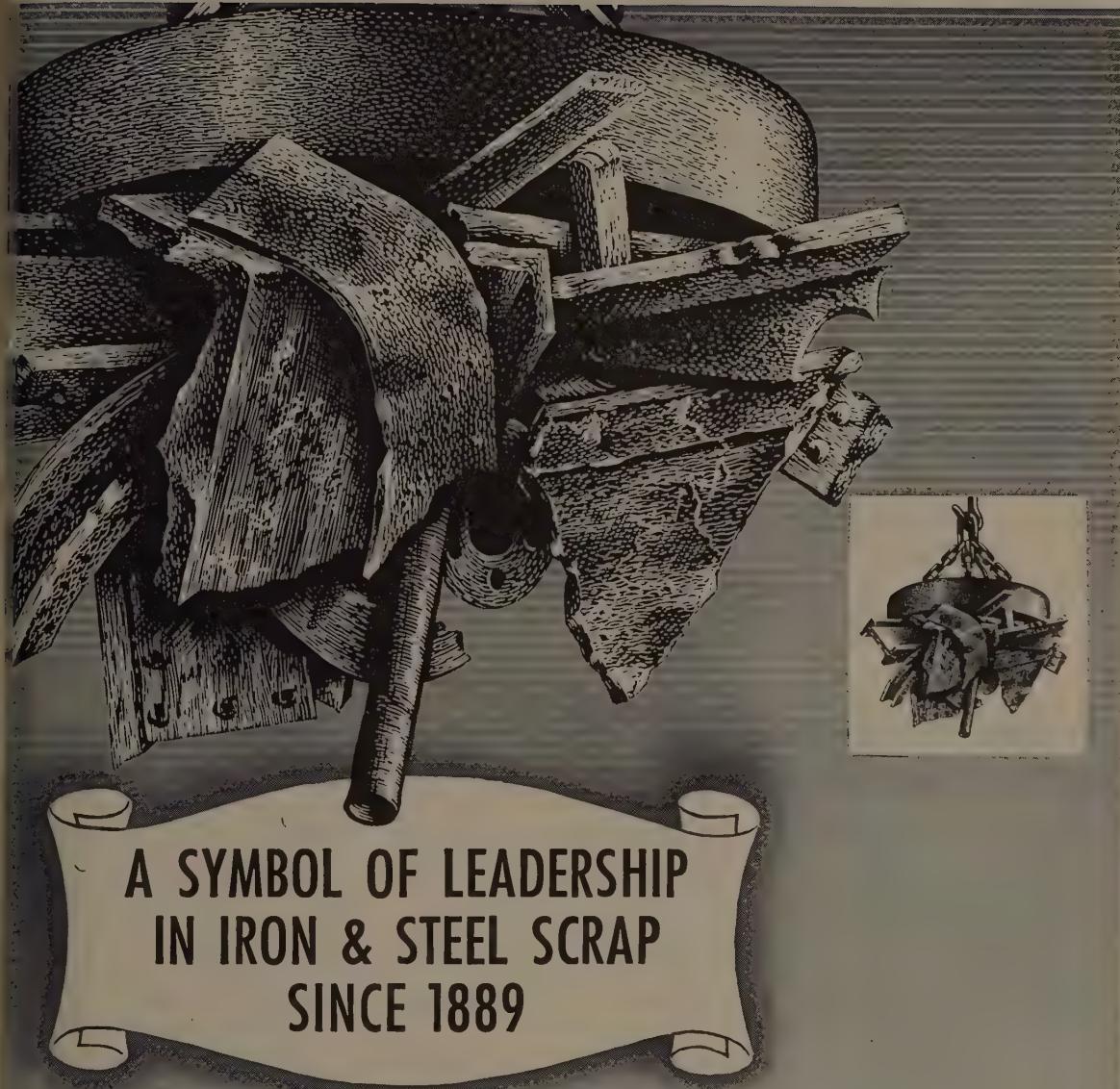
Heavy breakable cast	33.00
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Unstripped motor blocks	27.00
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Brake shoes	30.00
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Clean auto cast	30.00
-----------------	-------

No. 1 wheels	31.50-32.50
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(Concluded from page 237)

scribed as adequate. Cast iron grades are moving steadily with prices firm.

Seattle—The scrap market is weak with supplies ample. Larger buyers are apathetic to dealers' offerings. From a dealers' standpoint the situation is worsening. Further survey of the Japanese area is being made in the hope of developing an export movement from this side. Prices are unchanged.

## Iron Ore . . .

Iron Ore Prices, Page 229

Chicago—Inland Steel's fleet started its 1954 lake shipping season Apr. 13 when the *L. E. Block* left Indiana Harbor for Port Inland, Mich. It will return with a cargo of limestone. Three of Inland's other vessels, including the fleet flagship, *Wilfred Sykes*, will leave on their first runs Apr. 19, and another will start out the following day.

## Semifinished Steel . . .

Semifinished Prices, Page 212

Youngstown—The district steel operating rate last week dropped to 68 per cent of capacity, with two bessemer plants, 46 open hearths and 13 blast furnaces in operation.

U. S. Steel Corp.'s Ohio Works took off one more open hearth and cut its bessemer operations to six turns. In contrast, Republic Steel Corp.'s Warren Works is operating its iron and steel units full, while Youngstown Sheet & Tube Co., operating its seamless tube units at high level, is operating 10 of 12 open hearths at the Campbell Works and 7 of 12 at Brier Hill, also 5 of its 7 blast furnaces.

U. S. Steel Corp. last week announced further steps in a multi-million dollar expansion and modernization program at its Ohio Works and McDonald mills here. Additional steps include construction of a water circulation system at the Ohio Works for the turbo generator condenser, rebuilding No. 1 blast furnace, and modernization and expansion of the 43-inch strip mill by installing a new coiler, extension of some conveyor tables, a new shear and leveller and piler. U. S. Steel will use some of its idle employees on much of this work.

Seattle—Bethlehem Pacific Coast Steel Corp. is operating 3 of its furnaces at the local plant, the same capacity that has been in operation several months. Business prospect have improved. Northwest Steel Rolling Mills Inc. has maintained 100 per cent operations.

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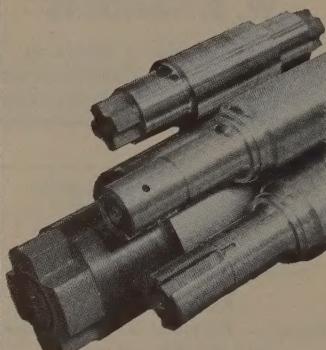
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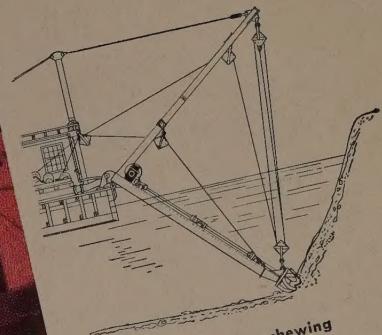
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Cleveland-driven cutter chewing through mud. Material loosened by the cutter is sucked up by the pump. Photo shows Morris Hydraulic Cutter Dredge with its indestructible 28-year old Cleveland drive.

# Dredge and its CLEVELAND-driven cutter survive destructive fire

**T**WO years ago, this hydraulic cutter dredge caught fire at Canandaigua Lake. The dredge and all its equipment—including a Cleveland drive and all its equipment—was severely burned. When salvaged, 26 years old, had to be completely repaired, including re-wiring, the dredge Cleveland worm gear speed reducer, however, was in good shape. All it needed was a change of oil. When put back into service, it drove the revolving cutter as dependably as it always had and is still driving it today.

When you think that this cutter has been through layers of mud, rock, sand, clay, silt and gravel, you see why it takes the best worm gear drive made—a Cleveland—to stand up under this punishing service. What is even more remarkable is that in 28 years of service, this Cleveland has only had one minor repair—one new oil seal. No wonder so many men who know Clevelands specify them for all their power transmission jobs.

Write today for free Catalog 400. The Cleveland Worm and Gear Co., 3270 East 80th St., Cleveland 4, Ohio.  
Affiliate: The Faral Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.



# CLEVELAND Worm Gear

# Worm Gear Speed Reducers

CUTLER-HAMMER

MOTOR CONTROL

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CHOICE OF THE LEADERS

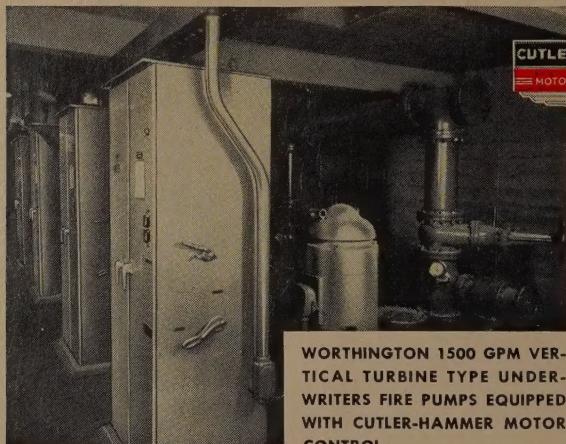
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DENISON HIGH PRODUCTION  
MULTIPRESSES WITH CUTLER-  
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FURNISHED AS ORIGINAL  
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TRANE AIR-CONDITIONING  
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BUILT BY PULLMAN-STANDARD  
FOR THE MILWAUKEE ROAD.



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ICAL TURBINE TYPE UNDER-  
WRITERS FIRE PUMPS EQUIPPED  
WITH CUTLER-HAMMER MOTOR  
CONTROL.



LONGYEAR STRAITLENE ELECTRIC  
DRIVEN DIAMOND CORE DRILL  
AS FURNISHED WITH CUTLER-  
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